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THE JOURNAL OF  
NEUROLOGY AND PSYCHOPATHOLOGY.





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THE JOURNAL OF  
NEUROLOGY AND  
(PSYCHOPATHOLOGY  
Psychiatry

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# THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

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VOL. I.

MAY, 1920.

No. 1.

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## Original Papers.

### A NOTE ON SUGGESTION.

By W. McDOUGALL, OXFORD.

IN a paper distinguished by clarity of thought and expression,<sup>1</sup> Dr. Bernard Hart has endeavoured to give greater precision to the meaning of the word 'suggestion'. He starts out by examining the definition of the process of suggestion which I had proposed;<sup>2</sup> he finds it not altogether satisfactory, and proposes to amend it. In this short paper I wish to defend my definition against this criticism, and to add some considerations on certain conditions of suggestion and of suggestibility.

My definition runs: "Suggestion is a process of communication resulting in the acceptance with conviction of the communicated proposition in the absence of logically adequate grounds for its acceptance". Hart's first criticism of this definition is that it is so wide as to be "of little use as a practical weapon of explanation". My answer is that a definition of a phenomenon or process should not aim at embodying an explanation or a theory of the process. The only purpose and function of the definition is to define, to mark off the class in such a way as to include all the phenomena or processes that properly belong to it, and to exclude all other phenomena and processes, especially such as may have some resemblance to those within the class without being of the same essential nature.

Hart objects that my definition would include a vast number of processes of simple communication which have nothing of the nature of 'suggestion': and he illustrates by saying that, when he is told that dinner is ready, he goes to the dining-room. I submit that such

acceptance of a proposition does not fall under my definition, for the reason that in this instance, and in the countless similar instances for which it stands, the grounds of acceptance of the proposition are logically adequate. That is not to say that the person who by his behaviour shows that he accepts the proposition thinks out or explicates the grounds of his acceptance. These logical grounds or reasons generally remain implicit; but if challenged to state them, the educated man can do so. Thus, when Dr. Hart is told by his servant at his usual dinner hour that dinner is ready, he could, if challenged, set out logically convincing reasons for accepting and acting on the proposition. But if the announcement were made half an hour before the usual time, he would for a moment be thrown into the sceptical attitude, and he would probably reply, "Are you sure?" or would ask for some explanation; thereby showing the presence in his mind of implicit reasons for accepting the proposition when made under the usual circumstances.

Hart goes on to say that "the essential process in suggestion consists in an inhibition of conflicting ideas", and, he adds, this "occurs whenever our stream of consciousness is directed by emotional or instinctive factors". I agree; for it was the main thesis of my *Social Psychology* that all our thinking is directed by emotional or instinctive factors; and I would maintain that all thinking, all attention, all concentration of the mind upon any object or topic, involves "an inhibition of conflicting ideas".<sup>3</sup> When, then, Hart amends my definition by adding the words, "owing to the fact that conflicting processes which are or should be present are inhibited", I reply that this is already implied in my definition, and that I have no objection to the addition, except that it appears to me to be redundant.

Hart's discussion of the nature of suggestion leads him to the conclusion that "all the processes ascribed to suggestion are in reality examples of 'complex thinking', and how large a section of 'complex thinking' is to be included under suggestion is a matter for purely arbitrary selection and limitation. Probably it would be practically advisable to limit the term to processes of communication involving a direct relation between persons, but even here no specific elements are present. In every case the only essential feature is the action of an emotional or instinctive factor, which is the essential feature of all 'complex thinking'. Processes of this kind are, however, so common in the human mind, that to explain any particular phenomenon by ascribing it to 'complex thinking' or to 'suggestion' is altogether inadequate. The explanation can only be accepted as satisfying and complete when we have ascertained the particular emotional factors responsible, and the conditions under which they have produced their results".<sup>4</sup>

Hart's conception of suggestion would thus include all processes of communication between persons in which the reaction of one to the other is of the nature of 'complex thinking'. I submit that this is too wide and loose a notion. When the devoted mother hastens to respond to the cry of her child, to calm its fear, or in any way to comfort or cherish it, her action implies 'complex thinking'; yet it hardly falls under the notion of suggestion. And every response of one person to another for whom he entertains a sentiment of love or hate or dislike or of any other kind would, according to Hart's definition, be an instance of suggestion. To make the denotation of suggestion so wide as this would, I think, practically destroy its usefulness as a technical term, and would be inconsistent with fairly well-established usage. It is necessary, as Hart has said, to ascertain the particular emotional factors involved. I have suggested the nature of the emotional or instinctive factor commonly, perhaps always, involved in 'suggestion', and I have a new argument to advance in support of that view. But first I would say a few words about the use of the term 'complex'.

The word 'complex' was, I believe, given currency in psychopathology by Dr. C. G. Jung, and by him, and by most of those who have adopted it, it is used to denote some idea to which is attached some strong 'affect', or emotional or instinctive tendency, and which is inaccessible to the voluntary recollection of the subject by reason of repression or of dissociation. Hart has used it in a wider sense, namely, to denote all ideas which, through the experience of the individual, have become directly connected with emotional or instinctive tendencies, whether they be repressed or dissociated, or under the normal control of the personality. This usage would make it synonymous with what I have proposed to call 'sentiment'. Dr. Percy Nunn, in his excellent *Education, its Data and first Principles*, uses the word in a still wider sense, namely, to denote every system in the structure of the mind which involves a conjunction of cognitive and conative dispositions. This usage would include in the denotation, not only the normal sentiments and the pathological sentiments which are the complexes in Jung's sense of the word, but also all the instincts; for, as I have repeatedly insisted, the instincts are not only conative-emotional dispositions; the structure of every instinct seems to include some cognitive disposition, whether simple and rudimentary or of considerable complexity. I recognize the advantage of having one comprehensive term to denote all such cognitive-conative systems; but the word 'complex' seems to me to have become usefully specialized and appropriated to denote the morbid or repressed system. Although I have no wish to try to force my usage of the terms on my colleagues, I think it may be



useful to illustrate by the following examples the usage of these three important words that commends itself to my mind.

First, suppose that a stranger suddenly assaults me on the street and I return an angry blow. This would be an *instinctive* response, the immediate and simple working of the instinct of pugnacity.\*

Secondly, suppose that the civil greeting of an acquaintance—Smith—excites in me some angry thought or action or a momentary feeling of vexation. That implies an habitual emotional attitude towards him on my part, i.e., the existence in my mind of a cognitive-conative system acquired through previous experiences connected with him. This system may be either a complex or a sentiment. If in our previous intercourse this person has repeatedly thwarted, vexed, or irritated me, and I have in consequence acquired this habitual attitude of incipient anger towards him, and if I remain aware of my attitude, can recollect the incidents which have given rise to it in normal fashion, and understand the relation of my attitude to these incidents, then my attitude and behaviour towards Smith are the expression of a normal sentiment of a simple kind.

Thirdly, suppose that Smith, whose civil greeting provokes on my part some angry or irritable response, is a colleague with whom I have always been on good terms, but who has been recently promoted to a post which I secretly desired to occupy. Suppose that I have disguised my desire and my disappointment from the world and from myself, so that I profess a complete indifference, or perhaps even somewhat noisily announce my pleasure in the appointment of my dear colleague Smith. Then my irritability towards Smith would be the expression of a 'complex', a morbid repressed sentiment. I should not be clearly aware of the peculiarity of my attitude towards him, or of its origin. I might 'rationalize', and declare that my irritability was due to dislike of the shape of his nose or of his manner of speaking or of wearing his collar. Just because I was unwilling to acknowledge, or incapable of recognizing, the origin and nature of my attitude, it would be pathological; there would be some conflict and disorder and lack of reasonableness in all my thoughts and feelings regarding Smith. In an extreme case it might lead me to behaviour which I could in no wise justify, which might be very prejudicial to myself, and out of harmony with my accepted principles and my general character. I urge that the term 'complex' should be reserved for such sentiments as by their nature and origin are of this pathological kind. For it was to such morbid sentiments that

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\* It is worth noting that the reaction, especially if the assault and the reply were verbal only, would have to be classed as an instance of 'suggestion', if Hart's definition were accepted.

the word was first applied as a technical term; and by adopting this usage of the two words 'sentiment' and 'complex' we shall enrich our vocabulary and render it more precise.

I return from this digression to the important question of the nature of the conative force at work in suggestion. Hart rightly insists that in all suggestion there is some conative force at work enabling the suggested idea or proposition to prevail over all rival or conflicting ideas; and he rightly adds: "If our knowledge is to be advanced, we require to know what is the particular emotional factor involved, and what are the precise circumstances of its operation." I entirely agree. In my *Social Psychology* I put forward the view that the conative force at work in the person accepting a 'suggestion' is commonly the instinct of submission. I wish now to say that a considerably enlarged experience of therapeutic suggestion has given me greater confidence in this view, and I wish to adduce some further considerations in its support. I do not wish to exclude the possibility that other instinctive tendencies may co-operate or may even play the chief rôle in certain cases. It is, I think, probable that fear may play this part on certain occasions. But I am inclined to believe that in both normal waking 'suggestion' and 'hypnotic suggestion' the impulse of submission is commonly the principal conative factor at work.\* First, let me insist on the reality and strength of this impulsive force of the 'suggestion'. When the hypnotic subject, either in hypnosis or in the post-hypnotic condition, feels compelled to carry out the 'suggested' action, this impulsion is, or may be, of great strength, so that he may struggle against it and yet fail to prevent its operation. Such impulsion cannot come from the mere presence in the mind of the idea of the action, no matter how clearly and vividly it be present to consciousness. One may suggest an action, and the subject may very clearly conceive it without experiencing the least impulsion towards it, if his attitude towards the suggester is not the appropriate one of 'suggestibility'; and this is true also of subjects who are distinctly in the hypnotic condition. For, as we all know, the hypnotic subject may remain quite uninfluenced by the suggestions of a third person, until the hypnotizer

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\* I am aware of the Freudian dogma that in 'suggestion' the impulsive force at work is always that of the sex instinct. I believe that the sex instinct may, and in some instances does, play some part in determining the effects of suggestion. But the assumption that this instinct commonly supplies the conative force in suggestion seems to me to be based merely on the fact that some subjects show signs of erotic excitement when in hypnosis, and on the Freudian prejudice which ascribes almost every form of conation or impulsion to the sex instinct. I would reject with equal confidence Mr. W. Trotter's assumption that all suggestion is the work of the 'herd instinct'. This assumption underlies implicitly and, in my opinion, largely vitiates, the reasoning of his brilliant little book, *The Herd Instinct*.

transfers or extends the 'rapport' to him, that is to say, induces by suggestion the extension to the third person of the subject's attitude of submissiveness or 'suggestibility'.

The new consideration I adduce in support of the view that this impulsive force is that of the instinct of submission is the following. Professor Pierre Janet and many other physicians, notably Dr. William Brown, have told us that they can hypnotize only neurotic subjects,\* and that, as they cure their patients, those patients became more and more resistant to 'suggestion'; until, when cured, they can no longer be hypnotized and are insuggestible.

The experience of others, myself included, is different. We find that a large proportion of normal persons can be hypnotized, and that our patients remain hypnotizable when cured. Those whose experience is of the former kind are no doubt inclined to think that our so-called normal subjects are not normal, and that our patients are not cured. I submit that this difference between us is a real fact of observation, and is founded not merely on error but upon a difference of practice or procedure in inducing hypnosis. I think it will be found that those physicians whose experience agrees with Professor Janet's are those who, in inducing hypnosis, adopt what I would, without meaning to be offensive, call the domineering attitude. Their tone is that of a man who forces the patient to submit to his will. They say, for example, "Now I am going to hypnotize you, and you will find this and that and the other"; and the subject, vaguely alarmed, is inclined to resent this procedure; that is to say, his self-assertive impulse is called into play. If, then, he is a normal healthy person, this self-assertive impulse carries the day; the physician fails to evoke in him the submissive attitude and impulse, and adds him to his list of normal persons who cannot be hypnotized. If, on the other hand, the patient is in a neurotic condition—that is to say, if his nervous forces are reduced and disordered—he is acutely aware of his weakness and of his inability to assert himself; his submissive impulse is then easily evoked, and he becomes suggestible. As, however, his condition improves, and he feels himself once more strong, his natural resentment towards this domineering attitude of the physician rises again, his impulse of self-assertion regains the upper hand; that is to say, he becomes insuggestible, and can no longer be hypnotized by this method.

Now consider the different effects of the opposite method of inducing hypnosis. Unless the subject is an intelligent educated

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\* They are inclined to generalize their experience in this matter, and to assert that only neurotic subjects can be hypnotized. This of course is an obviously illegitimate generalization of observations made under particular conditions.

person, one avoids using the word 'hypnotize', which is apt to raise a resistance in so many minds. One invites the co-operation of the subject; one explains to him as far as possible the nature of the operation and of the condition one wishes to induce, and asks him by an act of his own will to resign himself for the time being to one's influence. If this preliminary work is successful, the patient's resentment is not aroused, his good will and voluntary co-operation are secured; that is to say, the impulse of self-assertion, in so far as it becomes operative, works in the same direction as the submissive impulse, re-enforcing it, and the subject feels the satisfaction of successful co-operation with his physician; or, if he be in normal health, he feels no repugnance or resentment, no desire to assert his independence over against his would-be hypnotizer. And as the neurotic patient regains his strength and self-control, the same attitude persists, and he can at will resign himself to be hypnotized again, if good and sufficient reason appears.

In support of this interpretation I may adduce an experiment which I have repeated on several subjects. Choosing a subject who has been several times hypnotized by myself and who has proved what we commonly call a good subject, I say to him—"On this occasion I want you to do whatever I ask you to do in the way of bodily movement, but I want you to make up your mind that you won't be influenced by me". I then go through the procedure by means of which I have previously induced hypnosis, and on applying tests, such as challenging him to open his eyes or make other movements after being told that he cannot do so, I find that he can make all these movements, and I fail to elicit any signs of hypnosis. On being questioned, the subject tells me that he felt no influence from my suggestions or commands, that he felt no drowsiness, no heaviness of limbs or eyelids, and that he opened his eyes or made other movements without difficulty. I am not raising the question of the comparative therapeutic value of these two opposite methods of handling the patient. I am quite prepared to believe that the domineering method is, for some subjects at least, superior in therapeutic efficacy. But I submit that this explanation of the different results of the two methods supports my view of the curative forces brought into play. The disappearance of suggestibility with the disappearance of symptoms is due, I believe, to the suggestible or submissive attitude being replaced by the self-assertive attitude towards the physician. This self-assertive attitude, the dominance of the impulse of self-assertion, is, I submit, the essential condition of contra-suggestion and of contra-suggestibility. In this attitude the patient, instead of yielding himself to the physician's influence, positively rejects it, and, in doing so, is very apt to go beyond the point of mere indifference and to



over-shoot it by executing movements or entertaining opinions or beliefs the opposite of those suggested; for by so doing his self-assertive instinct finds a fuller satisfaction. •

I have one other slight contribution to offer to the psychophysiology of suggestion. We are often told in general terms that emotional excitement favours suggestibility. This has been especially insisted upon in respect of crowds; in which the prevalence of a general emotional excitement does seem to be one of the conditions greatly favouring suggestibility. On the other hand, a man fleeing or struggling in terror, or fighting in fierce anger, whether on the intellectual or physical plane, is not amenable to suggestion, unless those suggestions are congruent in tendency with his dominating emotion. There seems, then, to be something of a paradox here. We may, I think, easily resolve this seeming paradox. The emotional excitement which is finding vent in a definite line of action towards the end it seeks, is unfavourable to all but congruent suggestions; because the eonative energy of the process is too great to be turned aside or subdued by the energy of the submissive impulse. But a vague diffused emotional excitement that has no clearly envisaged end in view is favourable to the influence of suggestion, because, if the submissive impulse is brought into play in any degree by the person endeavouring to influence the subject by suggestion, this impulse will convert to its own ends the diffused excitement. This may be put physiologically in the following terms. The emotional excitement that has no outlet in any definite line of action involves the liberation of much nervous energy within the brain. This energy, having no outlet through any large system of efferent channels, becomes diffused through the brain, producing a condition of general high tension. As soon as the submissive impulse is brought into play, and directed towards some defined end and line of action, it operates with more force than it would in a condition of calmness, because its efferent channels become channels of outlet for the diffused energy hitherto banked up with increasing tension.

I venture to think that this explanation will be found neither improbable nor far-fetched by many psychopathologists, in spite of the fact that it assumes the truth of the principle of the vicarious usage of nervous energy, the principle that energy liberated in one part of the nervous system may be and often is transmitted to another part, there to co-operate with or reinforce processes which are quite distinct, as regards their anatomical seat and their function, from the parts in which that energy was liberated. This principle I have endeavoured to justify as an indispensable hypothesis in a number of articles. It is steadily ignored by the physiologists of the laboratory ;



but the experience of all who are constantly confronted with the problems of disordered action and control of the whole organism inevitably leads them to postulate it more or less explicitly.

In conclusion, I would comment upon a proposal to amend my definition of suggestion recently made by Dr. E. Prideaux.<sup>5</sup> His amendment would consist in changing the words 'process of communication' into the words 'mental process', so that the definition would run, "Suggestion is a mental process resulting in the acceptance with conviction of a proposition in the absence of logically adequate grounds for its acceptance". That is to say, Dr. Prideaux wishes to exclude any influence of one person upon another from the essential connotation of 'suggestion'.

His chief ground for desiring this amendment seems to be the consideration that the definition would then include the processes commonly called 'auto-suggestive.' Now 'auto-suggestion' has long seemed to me a notion of very questionable validity. The processes commonly so called seem to me to fall into two classes. The type of the one class is the insomnia patient in whom sleep has been induced by the 'suggestion' of a physician and who learns to help himself to fall asleep by repeating the formulæ used by the physician. In this case it is obvious, I think, that the personal influence of the physician plays its part, though he is not physically present. This interpretation is borne out by the fact that it is often helpful to such patients to imagine visually or in auditory terms the presence of the physician as they practise such 'auto-suggestion'. If this interpretation is correct, it follows that such so-called 'auto-suggestion' is not truly such, but falls under my definition of suggestion as essentially involving a communication from one person to another.

The other class of so-called 'auto-suggestion' may be indicated by the following passage from Dr. Prideaux's article: "That suggestibility may refer to a particular system of ideas only is also an important fact pointing to the affective nature of the process. A person is specially suggestible to ideas that are pleasing to him and which satisfy his egoistic instinctive tendencies". That is perfectly true. This suggestibility towards ideas or propositions that flatter our vanity is a case of the general law that we tend to accept or believe whatever proposition is congruent with strong conative tendencies, especially if they are active at the moment, whether organized in sentiments or unorganized. For example, if I am already frightened, I shall more easily accept as a threatening danger any unusual sight or sound; if I am a vain man, I shall interpret every passing glance in my direction as an admiring gaze; if I am a fond parent, I shall be liable to interpret my child's behaviour unduly favourably. According

to the definition as amended by Dr. Prideaux, all these would be instances not only of specific suggestibility, but of actual 'auto-suggestion'. This use of the word seems to me so wide and loose that it threatens to deprive it of all value. The principle that 'the wish is father to the thought' is so generally at work in our minds that almost all our mental processes, except the severest intellectual discipline, would fall under the head of suggestion. I submit, then, that Dr. Prideaux's amendment ought not to be accepted, but that communication of the proposition accepted should remain an essential part of the connotation of 'suggestion'.

Dr. Prideaux, following Dr. Myers, proposes a second amendment of my definition. For the words, "in the absence of logically adequate grounds for its acceptance", he would substitute the phrase, "apart from the intellectual outcome of pure judgement based on logical premises". I appreciate the ground of this proposal. My definition as it stands implies that the suggested proposition is necessarily one which cannot be logically justified. This, of course, I did not mean to imply. The essential feature of the suggestion-process is that the acceptance of the proposition takes place on other than logical grounds; that, even if adequate logical grounds can be adduced, the appreciation of them by the subject does not play the determining rôle in the acceptance of the proposition. I am therefore glad to adopt this proposed amendment, but I prefer other words than those substituted by Dr. Prideaux. My amended definition would run: "Suggestion is a process of communication resulting in the acceptance with conviction of the communicated proposition *independently of the subject's appreciation* of any logically adequate grounds for its acceptance".

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- <sup>2</sup> McDUGALL, *Introduction to Social Psychology*, chap. iv.
- <sup>3</sup> McDUGALL, "Physiological Factors of the Attention Process", *Mind*, N.S., x.
- <sup>4</sup> HART, *Loc. cit.*, 21.
- <sup>5</sup> PRIDEAUX, "Suggestions and Suggestibility", *Brit. Jour. of Psychol.*, 1920, March.

## THE TREATMENT OF CEREBROSPINAL FEVER.

By C. WORSTER-DROUGHT, LONDON.

IN spite of the application of lumbar puncture, no appreciable diminution in the heavy mortality-rate of cerebrospinal fever was apparent until after the adoption of treatment by a specific antimeningococcal serum administered intrathecally. The work of S. Flexner was undoubtedly the most important in establishing this method of treatment, now generally accepted as the most efficient we possess. It is true that in 1914-15, when the disease appeared extensively in Great Britain, and especially amongst mobilized troops, the results of treatment with the antimeningococcal serum then available appeared far from satisfactory. An explanation of this failure gradually came to hand in the recognition that the strains of meningococci responsible for the infection differed in the vast majority of cases from those used in the preparation of the antimeningococcal serum employed in treatment.

Early in 1915, however, M. H. Gordon<sup>1</sup> had begun his bacteriological investigation of cerebrospinal fever, and by means of agglutination and 'absorption of agglutinin' tests was able to differentiate three main groups or 'types' (termed Types I, II, and III) among the meningococci responsible for the outbreak of the disease in England; a Type IV was added later. The objection has been advanced by Eastwood<sup>2</sup> and others that the grouping of meningococci by serological methods is purely artificial and depends upon the arbitrary selection of particular strains as standards. Nevertheless, the practical value of Gordon's classification is undoubted, and it was of the greatest assistance in dealing with military outbreaks in this country. Since 1915, Gordon's 'types' of meningococci have been regularly employed, notably at the Lister Institute and, later, by S. Griffith at Cambridge, in the immunization of horses for the production of antimeningococcal serum for therapeutic use. As a consequence, therefore, of the improved serum available, the results for 1916 onwards showed a remarkable improvement as regards mortality-rate. A more widespread knowledge of the disease and of the importance of its early recognition has also served to improve the results.

Many excellent sera are now on the market, as, for instance, those of the Lister and Rockefeller Institutes and the Medical Research

Committee serum, which are valent for Gordon's four 'types' and are consequently admirably suited for use in Great Britain. More recently, sera monovalent for each of Gordon's types have been prepared by Griffith in the University Field Laboratories at Cambridge, the object being that, whenever it is possible to determine the infecting 'type' of coccus, the polyvalent serum is replaced by the corresponding monovalent serum.

In addition to serum administration, it is essential that the sub-arachnoid space be adequately drained of its exudate. When serum is given intrathecally, the preliminary lumbar puncture provides the necessary drainage. It is a frequent custom, however, when serum administration is discontinued, to perform no further punctures unless the patient becomes much worse. Formerly, this was also my own practice; but being dissatisfied with the results obtained, especially in cases that tended to run a protracted course, I adopted the plan of following the improvement after a certain period of daily serum administration by a routine daily lumbar puncture until cerebrospinal fluid clear to the naked eye was obtained.

**Summary of Treatment Adopted.**—Antimeningococcal serum is given intrathecally at the earliest possible moment without waiting for the bacteriological report, the initial dose being 30 to 40 c.c. This amount is then administered daily, or occasionally twice daily, until the clinical improvement is quite definite and undeniable, and organisms, if previously present, have disappeared from the cerebrospinal fluid. Owing to the fact that, occasionally, meningococci may neither be seen in nor cultivated from the cerebrospinal fluid obtained by lumbar puncture when clinical symptoms are well marked, the bacteriological findings are inclined to be misleading if relied upon solely. On post-mortem examination it is not unusual to discover meningococci in the ventricles when they have been absent from the cerebrospinal fluid obtained by lumbar puncture for some days before death.

The minimum period for the continuance of serum administration is four days, no matter how great the improvement in the patient's condition may appear. The dose is usually 30 c.c., excepting when it is only possible to obtain less than this quantity of cerebrospinal fluid; in such a case the fluid withdrawn should exceed the amount of serum injected by at least 5 c.c. A few exceptions to this rule will be mentioned later.

When the clinical improvement is quite decided and meningococci have disappeared from the cerebrospinal fluid, serum administration is omitted, lumbar puncture alone being performed and repeated daily until the cerebrospinal fluid is clear to the naked eye, there being no symptoms of hydrocephalus. Should any sign of a



recrudescence of meningitis occur during the period of repeated daily lumbar puncture, particularly mental changes, increased turbidity of the cerebrospinal fluid, or the reappearance of meningococci, serum administration is recommenced and continued on the same lines.

Vaccines are also employed, their use being of chief value in the later stages of the disease. The doses I administer are somewhat larger than those usually given. Administration begins within the first three days of treatment with an initial dose, for an adult, of 250 million organisms; doses are then given every fourth day, each dose increasing by 250 million organisms up to 500 million, and afterwards by 500 million up to 2500 million. Indications for a departure from this routine dosage are dealt with later.

**Results of Treatment.**—Of 72 cases of cerebrospinal fever of all types treated by the method described above—the daily intrathecal injection of serum, repeated lumbar puncture, and vaccine administration—57 recovered and 14 died (mortality 20·8 per cent). Of those proving fatal, in no case was death due to internal hydrocephalus; 13 fatal cases were of either the fulminating, acute fatal, or progressively purulent type; the remaining case was not received until the third day of a recrudescence (thirty-sixth day of total course), the early part of the patient's illness not being recognized as subacute cerebrospinal fever. The case proved fatal on the forty-third day of illness, from generalized hydrocephalus, due, as shown by post-mortem examination, to a blockage by fibropurulent exudate having occurred in the region of the foramen magnum. Of the 57 cases recovering, only four showed symptoms (temporary) of generalized hydrocephalus subsequent to the first week, and one those of internal hydrocephalus. The average duration of the course, as estimated from the day of onset, irrespective of the day treatment was started, to the day on which clear cerebrospinal fluid was withdrawn on lumbar puncture, was fourteen days.

**Importance of Early Treatment.**—Early treatment, and consequently early diagnosis, in cerebrospinal fever is of paramount importance. Its great significance cannot be fully shown by statistics, because in every series of cases there must occur some of a fulminating type which die within twelve to forty-eight hours. When first performing lumbar puncture on a suspected case, if the cerebrospinal fluid shows any turbidity, it is advisable to administer serum at once, without waiting for the bacteriological examination. Valuable time is saved, and no harm can be done by the serum to a possible case of pneumococcal or tuberculous meningitis.

**Treatment during the Pre-meningitic Stage.**—It is now generally admitted that the mode of infection in cerebrospinal fever is by the meningococcus being absorbed from the nasopharynx and carried

in the blood-stream to its site of election—the meninges. Not only do the symptoms at the onset of the disease suggest this mode of invasion, but in several reported cases the meningococcus has been isolated from the blood during the ‘pre-meningitic stage’, that is, at a time prior to infection of the meninges, when meningitis can be shown by the physical signs and examination of the cerebrospinal fluid to be non-existent. It is seldom, however, that cerebrospinal fever is diagnosed in the absence of signs of meningitis, but in cases in which the disease is suspected, especially on account of the presence of a petechial or purpuric rash, and the cerebrospinal fluid is found clear, antimeningococcal serum should be administered intravenously or intramuscularly, preferably the former. As regards intravenous injections, doses up to 200 c.c. of serum may be given. Herriek, indeed, advises doses up to 600 c.c., the resulting serum sickness apparently being no more severe than with the smaller amounts.

In some cases the initial shock may be extremely severe at the onset. This should be combated by the application of hot bottles and rectal or subcutaneous injections of normal saline solution at a temperature of 100°. Camphor (gr. 5), injected subcutaneously in the form of Cursehmann’s solution, may also be of assistance.

Even though antimeningococcal serum be given intravenously or intramuscularly, it is nevertheless essential to watch most carefully for the slightest sign of meningitis, such as increased neck rigidity, Kernig’s sign, delirium, or retention of urine. If there be the least suspicion that meningitis has developed, lumbar puncture must be performed, and, if the cerebrospinal fluid be found turbid, antimeningococcal serum is injected forthwith. When the fluid is apparently clear, films stained by Gram’s method are made from the centrifugalized deposit and examined microscopically, as it should be borne in mind that the presence of meningococci in the cerebrospinal fluid may precede an increase in the cell content and give rise to meningeal symptoms. The fluid should also be sown on ‘trypticagar’ and incubated.

**Reasons for Intrathecal Administration of Serum.**—Owing to the fact that the meningococcus produces its chief pathogenic effects by direct and local action on tissues, the full power of antimeningococcal serum can only be exerted when the immune principles on which these effects depend are brought into contact with the organisms in a concentrated form. In the presence of meningitis, therefore, serum injected subcutaneously or intravenously is practically useless; not only does it undergo an extremely high dilution in the blood-stream, but there is no evidence that it ever reaches the subarachnoid space. Dixon and Halliburton<sup>3</sup> have shown that, although the lining membrane of the subarachnoid space is permeable to substances

passing from the cerebrospinal fluid to the blood, it appears quite impermeable, except in the case of a few drugs (e.g., hexamine) and oxygen, in the reverse direction—from blood to cerebrospinal fluid. The choroidal epithelium is a stalwart barrier of secretory cells which keeps back even readily diffusible substances and allows only the normal secretion to escape.

The absorption of antibodies from the cerebrospinal fluid into the blood-stream, however, is fairly rapid. Debré,<sup>4</sup> by means of the sensitive precipitin reaction for a foreign serum, showed that the reaction appeared in the blood about ten minutes after the intrathecal injection of the foreign serum. Hohn,<sup>5</sup> by determining the content of the cerebrospinal fluid, found that the serum for the most part is absorbed within twenty-four hours.

Consequently, it is evident that for antimeningococcal serum to exert its maximum effect, it must be introduced directly into the subarachnoid space and, in order to make good the loss in concentration sustained by its absorption into the circulation, at intervals of not longer than twenty-four hours.

**The Question of Anæsthesia.** There is some difference of opinion concerning the advisability of administering a general anæsthetic for the performance of lumbar puncture. In routine neurological work I do not consider a general anæsthetic at all necessary as a rule. It is, of course, essential in tetanus, but in cerebrospinal meningitis I have used general anæsthesia only when the patient has been particularly violent. Provided one has a competent assistant with a thorough knowledge of the requisite position in which to hold the patient, the operation is performed without difficulty, always allowing the necessary skill on the part of the operator.

Patients when conscious do not often complain of the actual puncture when it is rapidly performed and the canal entered at the first attempt; further, an anæsthetic in meningitis is not altogether free from risk, and when given daily may interfere considerably with the patient's nourishment. In restless cases a hypodermic injection of morphine (gr.  $\frac{1}{4}$ ) and atropine (gr.  $\frac{1}{100}$ ), given about twenty minutes before the puncture is performed, will often assist in calming the patient.

**Dosage of Serum.**—In contrast to antidiphtheritic serum and tetanus antitoxin, there exists no definite measure of the potency of antimeningococcal serum; consequently, the dose is measured by volume. As a general rule, with certain exceptions that will be mentioned later, the amount injected at a single administration should be at least 5 c.c. less than the quantity of cerebrospinal fluid withdrawn. In my own cases over 15 years of age, the initial dose has varied from 30 to 45 c.c., the usual dose being 30 c.c. The subsequent serotoxic reaction is certainly no more severe in cases

receiving the larger doses than in many of those to whom only 30 c.c. are administered. As regards children, in relation to age, the following doses may be given: 1 to 5 years, 5 to 15 c.c.; 5 to 10 years, 10 to 20 c.c.; 10 to 19 years, 20 to 40 c.c.

Following the first injection, serum is continued in daily doses of 30 to 40 c.c. for adults and adolescents.

As regards the total dosage of serum administered to an individual case, in my own series the quantity has varied from 120 c.c. to 600 c.c.

**Administration of Serum.**—The serum is much better given by the gravitation method—first introduced by Heiman in 1908—than injected by means of a syringe. However slowly the serum is forced in with a syringe, there is always the risk of respiratory failure occurring from a sudden increase of intracranial pressure. Also, the intrathecal administration of serum is almost invariably accompanied by a fall in blood-pressure; injection with a syringe tends to increase this fall, with the consequent risk of collapse. In many hundreds of intrathecal serum injections by the gravitation method, in contrast to those with a syringe, I have never seen any indications of respiratory failure or collapse. It appears unnecessary, therefore, provided the respiration be carefully watched, to take the further precaution, as advocated by Sophian,<sup>6</sup> of registering the blood-pressure as an ocular guide to injection by the gravity method.

If the patient is straining, the inflow of serum may be very slow indeed, and scarcely discernible. Also, he may complain of considerable 'cramp' in the legs caused by the sudden rise of pressure acting on the roots of the cauda equina. To obviate the initial pain, the funnel should only be raised slowly from the horizontal level of the needle; the pain is also less when the serum is warmed to body temperature than when it is injected cold.

In my earlier cases a complaint of cramp was almost invariable. I found, however, that by directing the patient, when his mental condition permitted, to breathe deeply with a somewhat long inspiration and a short expiration, the inflow of serum was greatly accelerated and he ceased to complain of cramp and pain. On inspiration there is a considerable lowering of pressure in the intrathecal canal, with a corresponding increase during expiration. When the expiration is long and the inspiration short the serum scarcely moves, but with a long inspiration it flows rapidly.

Some observers recommend the washing out of the subarachnoid space with normal saline before injecting the serum; personally, I have not found this proceeding of any material advantage.

**Accidents during Serum Administration.**—Such disturbances as have been described during the intrathecal injection of serum are



usually due to a sudden increase in intracranial pressure and a consequent depression of the respiratory centre. The first abnormal sign is some embarrassment of respiration, the breathing becoming shallow, slow, and occasionally irregular. If the serum be forced in with a syringe, respiration may suddenly stop, although the heart continues to act well. At other times such symptoms result from the too rapid administration or the injection of too large a quantity of serum. Should any symptoms of respiratory embarrassment occur, the intrathecal injection must at once be stopped by lowering the funnel and allowing the serum that has already entered the subarachnoid space to escape. Artificial respiration and the injection of cocaine and atropine in full doses will usually suffice to restore the patient.

Using the gravitation method, allowing the serum to enter the intrathecal sac only very slowly, the flow being regulated by alternately raising and lowering the funnel, and watching carefully the patient's respiration, I have never met with indications of respiratory failure.

Occasionally, incontinence of faeces may occur during the inflow of serum. This is no doubt due to the sudden stimulation of the third and fourth sacral nerve roots. Care, however, must be taken to ascertain that such incontinence is not the result of collapse.

**Continuance of Serum Administration.**—Following the initial dose, serum injection is repeated daily, usually in doses of 30 c.c., after as much cerebrospinal fluid as possible has been evacuated. In acute cases, the second dose may be given twelve hours after the first. Serum administration is then continued daily until clinical improvement, as indicated by a normal mental and sphincter condition, decreased muscular rigidity, absence of meningococci from the cerebrospinal fluid, etc., is quite definite. After the first two or three injections, there is seldom any distinct advantage in repeating the dose of serum every twelve hours. If, however, owing to only a small amount of cerebrospinal fluid being obtainable, the full dose of serum cannot be given at the morning lumbar puncture, a further injection may be given during the evening.

However great the patient's improvement may appear, serum should be given on at least four successive days, and on no account should it be withdrawn if meningococci are still visible in stained films of the cerebrospinal fluid or obtainable in culture, as until meningococci have disappeared there is no certainty that the patient is free from danger.

Should signs of a recrudescence of meningitis appear after the period of serum administration has ceased, the injection of serum must at once be resumed, and repeated daily until further improve-

ment occurs and organisms have disappeared from the cerebrospinal fluid; lumbar puncture is then continued daily until a clear fluid is obtained.

*Anaphylaxis.*—Owing to the risk of anaphylaxis, serum administration must not be resumed without first inducing anti-anaphylaxis if the period since the last serum injection exceeds eight days. It is of considerable importance, however, to overcome the meningococcal infection, as far as possible, in one continuous course of serum treatment.

The following method of inducing anti-anaphylaxis rapidly, based on the work of Besredka and Friedberger, is described by C. H. Browning:<sup>7</sup> 5 c.c. of the serum it is proposed to inject are diluted with 50 c.c. of normal saline. Of this mixture, 1 c.c. is injected intravenously, followed by 3 c.c. four minutes later, 10 c.c. after another two minutes, and finally 25 c.c. after two further minutes. The dilute serum is best administered by means of a graduated funnel attached to the intravenous needle by a rubber tube: the latter can be pinched with a clip for the requisite intervals during the injection. Fifteen minutes after the above injections, the full therapeutic dose of serum may be administered.

General anaesthesia and the hypodermic injection of atropine (gr.  $\frac{1}{15}$ ) are also stated to prevent the occurrence of anaphylactic symptoms.

**The Amount of Serum Injected in Relation to the Amount of Cerebrospinal Fluid Withdrawn.**—As a general rule, the amount of cerebrospinal fluid evacuated by lumbar puncture should exceed by at least 5 c.c. the quantity of serum injected. In certain cases in which the amount of cerebrospinal fluid obtainable is less than the quantity of serum it is desired to administer, an exception may be made. Provided that there is no evidence of increased intracranial pressure, and that the serum is not forced in with a syringe, but merely allowed to flow in at not more than twelve to eighteen inches water pressure by the gravitation method, I have found the administration perfectly safe; as a precaution, however, the patient's respiration should be carefully watched. In such instances, the amount of serum given may equal and even exceed by 15 to 20 c.c. that of the cerebrospinal fluid withdrawn. By the gravitation method, and at the pressure mentioned, the serum will usually cease to flow when the intrathecal pressure is approaching the limits of safety.

When there is distinct evidence of increased intracranial pressure, —e.g., hydrocephalic symptoms—the injection of a larger amount of serum than of cerebrospinal fluid withdrawn must not be entertained.

**Repeated Lumbar Puncture.**—When clinical improvement is quite decided and organisms have disappeared from the cerebrospinal

fluid, as previously described, the administration of serum is discontinued: lumbar puncture, however, is still performed daily until a cerebrospinal fluid quite clear to the naked eye is obtained, pyrexia being absent and the patient being free from any symptoms indicating hydrocephalus. At each lumbar puncture, cerebrospinal fluid is allowed to escape until the flow of fluid practically ceases. This procedure ensures that the exudate is removed as far as possible, and that the subarachnoid space is flushed out from above by the secretion of fresh fluid by the choroid plexus. It is true that H. D. Rolleston<sup>8</sup> has considered the possibility of harm resulting from repeatedly withdrawing cerebrospinal fluid, as, to quote this author's own words, "an excessive secretion of cerebrospinal fluid, perhaps comparable to cerebrospinal rhinorrhœa, may be induced". In my experience, however, this has never been the case: on the other hand, I have seen nothing but good result; and there is no doubt that, in addition to shortening the course of the disease, the repeated draining of the exudate from the subarachnoid space tends to inhibit the development of any serious degree of hydrocephalus.

For all practical purposes, when the cerebrospinal fluid becomes clear, sterile, and under approximately normal pressure, no evidence of hydrocephalus being present, the course of disease may be said to have ended. At this stage subjective symptoms are absent, and the only sign is usually some degree of muscular rigidity, as shown by slight stiffness of the neck and a modified Kernig; the latter is usually the last sign to disappear.

Following the cessation of serum administration, the number of days of repeated lumbar puncture in my cases has varied from three to fourteen. By varying the site of puncture from time to time, I have never experienced any trouble with the skin wounds. It is found that the skin can be kept in better condition by avoiding collodion dressings. On withdrawal of the needle after each operation is completed, the wound is merely swabbed with a mixture of equal parts of tincture and liniment of iodine.

**Treatment in Relation to Type of Infecting Coccus.**—The question of the specificity of the serum is a most important one. Indeed, it is probable that the presence of an inert serum in the intrathecal sac may be positively harmful; horse serum when thus injected gives rise to an aseptic meningitis which, in the absence of any specific antibodies, may favour the passage of meningococci through the tissues. Since it is of paramount importance that the therapeutic serum should correspond with the strain or 'type' of the infecting meningococcus, as well as for the comparison of results, it is to be regretted that several different classifications of meningococci exist, and, further, that there appears to be considerable confusion as

to the correlation of the 'types' of different observers. If a classification of meningococci based on 'types' is to be adopted generally, it is clear that some endeavour should be made to arrive at uniformity. In my experiences with military cases, working in conjunction with A. Mills Kennedy, M. H. Gordon's classification proved of the utmost practical value and the one which we used almost exclusively.

At the initial lumbar puncture and withdrawal of cerebrospinal fluid, an antimeningococcal serum, in the production of which the prevalent types of meningococci have been employed, is injected intrathecally without awaiting the bacteriological report. In my own cases I have usually employed polyvalent serum corresponding to Gordon's four types and prepared by the Lister Institute or the Medical Research Committee. Failing a knowledge of the production of the serum, the agglutinating power of the opsonic reaction towards the particular type of meningococcus isolated from the patient should be tested. Although these tests are of limited value, in the present state of our knowledge it is safer to discard a serum showing little or no agglutinating power towards the type of coccus concerned in the infection. More recently, Gordon<sup>9</sup> has described a method of testing the immune serum for anti-endotoxin which appears to be a more reliable test of therapeutic activity.

Monovalent sera for each of Gordon's four types have also been prepared by S. Griffith, at Cambridge, under the auspices of the Medical Research Committee (M.R.C. serum). As soon as the 'type' of meningococcus cultivated from the patient's cerebrospinal fluid is identified by means of the agglutination test, the monotypical serum corresponding to that particular 'type' of meningococcus may be substituted for the polyvalent serum. When, however, the 'type' cannot be identified—as, for example, when the organism, although visible on direct microscopical examination of stained films of the cerebrospinal fluid, fails to appear in culture—the criticism has been advanced that one must continue the polyvalent serum at the risk of greatly diminishing therapeutic potency, or grope blindly after the requisite monovalent serum. Nevertheless, the polyvalent serum, even if used exclusively, will usually be found to give most satisfactory results.

If no response to the polyvalent serum occur, however, the monovalent serum corresponding to the prevalent type of meningococcus in the particular district should be tried. Also, it should be borne in mind that a swab from the patient's nasopharynx may yield the necessary meningococcus, or that there may be several 'positive contacts' to whom one 'type' of meningococcus is common.

M. H. Gordon considers that 80 to 85 per cent of all cases of cerebrospinal fever occurring in England are due to Types I and II



(Gordon) meningococcus. Consequently, he suggests that when a case is seen for the first time, injections of Types I and II sera, pooled, should be given until the type of infecting meningococcus is determined; the corresponding monotypical serum can then be substituted. In the Woolwich Military District (comprising the greater part of outer London) during the war, however, A. Mills Kennedy found Type III quite as prevalent as Type I; Type IV, as elsewhere, was rare. Consequently, it would appear better to begin with a serum valent for Types I, II, and III (Gordon), unless it is definitely known that a particular type has occurred with frequency in other cases of the same origin.

**Vaccine Treatment.**—The doses of vaccine I administer are somewhat larger than those usually employed. Thus, in adults, a dose of 250 million organisms is injected subcutaneously at some time during the first three days of illness, the second dose consisting of 500 million, each of the subsequent doses being increased by 500 million up to a maximum of 2500 million. The last two doses are not always necessary. In children, the initial dose may be 10 million, the second 50 million, and each subsequent dose increased by 100 million. The vaccine is preferably autogenous, but as this takes some time to prepare, a polyvalent vaccine is given at first and is replaced by the autogenous vaccine as soon as the latter is available. The sensitized polyvalent vaccine I have used (and for much of which I am indebted to Sir Kenneth Goadby) consists of the four types of meningococci differentiated by Gordon. Monovalent vaccine, in the absence of autogenous, should be used in those cases in which the 'type' of infecting coccus has been determined. When the 'type' is not determined, polyvalent vaccine is used throughout.

Vaccine administration should begin within the first few days of treatment with, as stated above, a dose of 250 million organisms; the gradually increasing doses are then given every fourth day. If the reaction to a particular dose is at all pronounced, the same dose is repeated four days later; usually no reaction follows the repetition. The increase of 500 million is then made on the next occasion of administration.

Cases in which the effect of vaccine is certainly beneficial are those subacute ones which tend to run a somewhat long course. In some cases, the third or fourth dose is followed by a transient rise of temperature; subsequent increased doses, however, usually fail to produce any marked rise in temperature or pulse-rate. A slight local reaction may occur in a few cases.

At the present time, as far as I am aware, detoxicated vaccines have not been employed in the treatment of cerebrospinal fever, but they appear quite worthy of trial.

**General Management and Treatment of Symptoms.** — The ward or room chosen should be isolated and be provided with an abundance of fresh air. Nurses should be specially experienced, as careful nursing is of extreme importance. The patient's head is kept fairly low, and the hair cropped close to the scalp. Unconscious patients should be turned frequently and not be permitted to lie in the same position for hours at a time, as hypostasis is undoubtedly a predisposing factor in the development of pneumonia in cerebrospinal-fever cases. In all severe cases it is desirable that a water-bed be substituted for the ordinary mattress, as, unless this precaution be taken, difficulty with bedsores will be experienced. As regards the transport of patients by motor ambulance, in my experience the danger is negligible.

As a rule, the digestive functions are not greatly disturbed in cerebrospinal fever, and the appetite is often well maintained. In the early acute stages fluids are given, and as soon as possible semi-solids should be allowed. There is no need to wait for the disappearance of pyrexia before ordering a fish diet; patients are hungry and take food well towards the end of the course.

For the relief of headache, phenacetin and caffeine may be given and repeated twice daily; cold applications are also of benefit. Acetylsalicylic acid will frequently relieve muscular pain; as a routine measure, I give acetylsalicylic acid (gr. 10) after serum administration. The most efficacious measure for the prevention of vomiting is repeated daily lumbar puncture according to the method previously described. Sulphonal (gr. 20 to 30) will be found useful in promoting sleep. For obstinate insomnia or when delirium with restlessness is present, morphine (gr.  $\frac{1}{4}$ ) should be given. Paraldehyde is of little value in the delirium of cerebrospinal fever, and hyoscyne should be avoided. Warm sponging may often assist in relieving restlessness.

Should symptoms of cardiac failure or of a falling blood-pressure develop, hot saline infusions (100°) should be given, either rectally, or subcutaneously in the pectoral region, every eight to twelve hours. Digitalin (gr.  $\frac{1}{100}$ ) hypodermically is also useful. Strychnine, owing to its tendency to precipitate convulsions, should not be administered.

As cerebrospinal fever is an exhausting disease, patients should remain in bed for at least ten to fourteen days after the termination of the course.

**Treatment of the Nasopharynx.**—As soon as the condition of the patient permits, measures should be taken to free the nasopharynx from meningococci. This is important, true relapses being probably due to a further absorption of meningococci from this situation, as the organism, unless prevented, may often persist in the nasopharynx after recovery has taken place. Sterilization may be effected by

causing the patient to sniff a warm solution of 1 per cent chloramine-T into the nostrils from the palm of the hand, expelling it through the mouth. This is repeated twice daily under supervision until two or three successive nasopharyngeal swabs have proved negative.

**Treatment of Complications.**—Repeated daily lumbar puncture, following the period of serum administration, largely counteracts any tendency towards the development of hydrocephalus. Nevertheless, symptoms of this serious complication occur occasionally. The question of its treatment is most important, and one with which it is hoped to deal in a further communication.

Cases in which meningococci are cultivated from the blood-stream, in the presence of definite meningitis, should be given anti-meningococcal serum intravenously as well as intrathecally. The prognosis is bad, but some cases recover. Pneumonia is treated on the usual lines, its occurrence being no indication for stopping the intrathecal injection of antimeningococcal serum. Arthropathies, as a rule, subside fairly quickly with simple immobilization and warm applications. If much distended, the joint should be aspirated, and 5 to 10 c.c. of antimeningococcal serum should be tried; this procedure usually results in prompt recovery. In pyelitis or cystitis, hexamine is prescribed and almost invariably leads to subsidence of the complication. If iridochoroiditis develop, intravitreal injection of antimeningococcal serum should be performed; instances of suppurative iridochoroiditis have occurred in which this treatment led to rapid recovery, sight being retained.

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## THOUGHTS ABOUT THINKING AND DREAMING, AND THE FREUDIAN EXPLAN- ATION OF DREAMS.\*

BY F. PARKES WEBER, LONDON.

THINKING and dreaming! How easily the one passes into the other! Our thoughts begin to 'wander' when we are tired, or when we allow our minds to enter into a reverie or day-dream or to 'build castles in the air'. When we are tired-out over literary or other work, necessitating much and long-continued efforts of our reasoning faculties, our thoughts tend at last to 'wander'—the voluntary, directed, objective efforts of the fully conscious mind give way to the easy, swiftly flowing, objectless, but usually pleasurable, play of fantasy—heralding the approach of a state of subconsciousness and the overpowering onset of deep sleep and complete unconsciousness.

So also I believe that the unconsciousness which often comes before death is not rarely preceded by a dream-like state of the mind—a condition free from pain, which may be an actually pleasurable one of mental euphoria. In exhausted and toxic conditions (septic fevers, etc.) of the body, the mind is indeed often mercifully allowed to 'wander', and an easy dream-like subconscious state of mental fantasy, or a 'busy', but mostly not unhappy, delirium succeeds the conscious pain, malaise, or wretchedness of grave disease.

The visual and auditory hallucinations and delusions in severe diseases, toxic conditions (delirium tremens, etc.), and various forms of insanity are *pathological* dream-like phenomena, resembling ordinary, more or less *physiological*, dreams in being unrestrained by the higher psychical controlling mechanism (that is to say, by the normal mind). They consist, like ordinary dreams, of a series of images and sensations running riot—for example, the kaleidoscopic (often *kakeidoscopic*) ever-changing hallucinations and delusions of delirium tremens. The difference between the more or less normal

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\* I have here made a few additions to these "thoughts on the endless subject of thinking", which were written about the end of 1918 (under the heading, "Thinking and Dreaming and the Explanation of Dreams"), as a contribution to the volumes dedicated to Sir William Osler on his 70th birthday (published by Paul B. Hoeber, New York). Since then similar criticisms have, I believe, been published in regard to the exaggerated significance attached by Freud to the sexual element in dreams.—F. P. W.



phenomena of ordinary dreaming and the pathological phenomena of such hallucinations and delusions is that in the former it is only the borderland between the fully conscious and the unconscious regions of the mind that is concerned, whereas in the latter the whole mental field may be involved, for the higher portion has undergone a (probably only temporary) regressive change, so as to have become reduced to the condition of the subconscious mind.

On every side, and from whichever way we look at it, thinking passes gradually into dreaming—or rather, the fully conscious, objective, and reasoning effort of thinking falls to a lower, semiconscious, easily-flowing, and unrestrained ‘play of thought’, which tends to become more and more fanciful as it gradually passes altogether out of the limits of voluntary control. Such dream-like thought doubtless represents the mode of thinking characteristic of our infancy, and of our remote ancestry (the childhood of the whole human race), and (probably to some extent also) of animals.

Allowing the thoughts to ‘wander’, the phenomena of reverie, day-dreams, and ‘building castles in the air’, furnish us with the connecting links between the normal adult mode of thinking on the one hand, and true dreaming on the other. Some young (and even older) persons fall more readily than others into a habit of day-dreaming and building castles in the air, and many of them must indeed welcome their day-dreams and gladly seek to indulge a habit which gives them pleasure and fairy-like delights as compensation for the hard realities of their actual life’s experience.

In true dreaming during sleep—generally preceding the onset of deep (completely unconscious) sleep, or heralding the return to wakefulness—voluntary control of the thoughts is entirely absent, and the mind runs its own subconscious course, free from the (sometimes rather irksome) fetters of reason and conscience, and unguided by its own god-like will-power. Reversion to the primitive dream-like method of thought may be beneficial, even when undesired, and often comes as a relief to mortals exhausted by fatigue, shock, or disease. In fact, effortless dream-thought may be restful to the mind, just as intervals of ease and sleep are refreshing to the body.

C. G. Jung,<sup>1</sup> of Zürich, insists that the comparison of the themes of dreams with those of myths (mythology) suggests the idea—as explained by Nietzsche and Freud—that from a phylogenetic point of view dream-thought is a regressive phenomenon and should be regarded as an older form of thought: in fact, that dreaming represents the survival of a kind of childish (infantile) or ancestral mode of thinking. How well Nietzsche<sup>2</sup> expressed this idea is shown by the following quotation given by Jung:<sup>3</sup> “In our sleep and in our dreams we pass through the whole thought of earlier humanity. I

mean, in the same way that man reasons in his dreams, he reasoned when in the waking state many thousands of years. . . . The dream carries us back into earlier states of human culture, and affords us a means of understanding it better. The dream-thought is so easy to us now. . . . To a certain extent the dream is a restorative for the brain, which during the day is called upon to meet the severe demands for trained thought made by the conditions of a higher civilization. From these facts we can understand how lately more acute logical thinking—the taking seriously of cause and effect—has been developed: when our functions of reason and intelligence still reach back involuntarily to those primitive forms of conclusion”. Of the two modes of thought, Jung points out<sup>4</sup> that modern adult trained thought (directed thinking), working for communication with speech elements, is troublesome and exhausting, whereas dream-thought (the infantile or ancestral mode of thought) goes on without trouble, working spontaneously with reminiscences.

Nothing seems to me (F. P. W.) better able to illustrate and contrast the two main classes (conscious and subconscious) of thought than the following considerations on mental preoccupation from the psycho-analytical point of view. When a person's mind is preoccupied by anxieties, regrets, or disagreeable ideas, there is a desire to go back—‘retire into one's self’, search one's mind, and analyze the disquieting elements in it (vague and almost subconscious though they may be). It is difficult to readily ‘collect one's thoughts’ for the immediate work before one—one wishes to clear the mind first, in order to start afresh on the ordinary practical business of one's daily life. When immediate work is very urgent, however, and one has to do it, one may succeed in driving back the disturbing elements into the subconscious regions of the mind. Even then one's mind does not work normally, rapidly, and smoothly as it generally does in most persons—‘the machinery wants oiling’—or, in telephonic language, ‘the junctions are engaged’ just when one wants to use them. Clearly, in the mental processes employed for ordinary voluntary work, the subconscious part of the mind plays a part—probably an important connecting part, as if it were a region through which the ‘wires of telephonic communication’ have to pass, *by means of which* the ‘voluntary run of one's thoughts’ is facilitated, checked, and ‘fed’ or ‘nourished’ and embellished (that is to say, with the memory or subconscious memory of experiences or of what one has witnessed, heard, or read of). Compare the useful part played by the subconscious mind in the phenomena of ‘suddenly remembering something’ that had ‘escaped one's memory’, or when ‘something is suddenly called back to one's mind’ by a process of rapid involuntary mental association.

Ordinary experience seems to me<sup>5</sup> to explain dreams (from another point of view) as hallucinations (visual, auditory, etc.)—or rather, as a series of images and sensations—presenting themselves to the subconscious mind, or the border (‘twilight’) region between unconsciousness and complete consciousness—founded on or suggested

by incidents, impressions, or thoughts in the dreamer's previous, generally quite recent, life—often disturbed, disconnected, or fantastic, owing to the necessary absence of control by the higher conscious mind (the psychical controlling mechanism), and often, therefore, untrue to life and opposed to the dreamer's character, at least to his actions when under the guidance and control of his conscious mind. Bergson pointed out that dreams result from 'relaxed consciousness'—in other words, they result owing to the working of the mind becoming temporarily regressive, trained (directed) conscious (wakeful) thought giving place to the easier (flowing) 'ancestral' dream-thought. It is no wonder, therefore, that what a person during sleep dreams that he does (his action in his dreams) is often out of keeping with what is known of his previous life. In ordinary wakeful conversation some persons will lazily content themselves with a mere guess at the meaning of a word that they do not understand. In dreams, when any question as to the meaning of anything arises, the first explanation that presents itself to the dream-mind is generally unhesitatingly accepted, however improbable it may be. There is a child-like readiness to believe anything—any 'fairy tale'!

If the above-stated conception of the nature of dreams be admitted, how can one support the Freudian claims that nearly all dreams allow of an obvious or latent (cryptic) sexual interpretation? Such teaching seems opposed both to theory and to common experience, and in fact to be irrational. In ordinary thought a sexual character is only occasionally present—why should it invariably be present in dream-thought? Most persons ordinarily think and dream (if they know that they have any dreams at all) about matters which have nothing specially to do with sex. One might just as well seek to explain all the fancies and hallucinations of delirium tremens and all the delirious ideas and delusions of fevers and acute mania as if they always rested on a sexual basis.

In many cases the correct source or starting-point of dreams can readily be found in the dreamer's previous experiences, what he has done, witnessed, listened to, been told of, read of, thought of, approved of, disapproved of, or discussed; that is to say, in his previous (generally recent) life. But the bulk of ordinary emotion in life is not of a sexual nature. In a recent paper<sup>6</sup> I gave illustrations of what was supposed to 'constitute life' amongst ordinary sensual individuals in bygone times, when the general public was, as a rule, little reticent on sexual matters, and did not endeavour so much as now to conceal the sexual factor in every-day life.

Then as now, to the average kind of sensual individual, 'life', or the sensual gratification of life, was largely a matter of: (1) Eating and drinking, satisfying to the full the imperious basic instincts of

preventing starvation and thirst; (2) Hunting, sport, outdoor games and bathing, obtaining food, and keeping one's body in health by suitable muscular exercise, cleanliness, and friendly competition; (3) Indoor games, music, art, and social amusements, satisfying the instinct for ordinary pleasant domestic and social recreations and emotions; (4) Sexual matters, that is to say, functions and emotions connected with the instinct of reproduction, have always taken their due part in popular ideas of 'life', though this is not such a large and exclusive part as some modern writers have apparently supposed.

We may safely take it, I think, that amongst ordinary sensual human beings of past and present times the basic and dominating desires and enjoyments of fully conscious (wakeful) life have been by no means limited to those of the sexual class—and so it is with dreams. The sexual element in dreams is doubtless greater than the sexual element in wakeful life, which is under conscious mental guidance: but sexual ideas, emotions, etc., do not by any means monopolize dreams. Ordinary individuals dream of common incidents in their daily life, their ordinary occupations, duties, work, recreations, pleasures, successes, failures, disappointments, eating and drinking, riding, hunting, shooting, outdoor and indoor sports and games, music, art, and 'hobbies', social entertainments, conversations with friends, etc. Naturally, in disordered states of the higher nervous system, due to shock, overstrain, fatigue, toxic conditions, fevers, etc., and, when the stomach or intestines are distended or diseased, nightmare-like dreams of a terrifying nature are not uncommon. A neurotic child, brought up in an atmosphere of fairy tales of old-fashioned days, is likely often to dream of witches, hobgoblins, and man-eating ogres. A young woman saturated with the vampire legends of Eastern Europe might, during the delirious state of acute pneumonia, have fancies resembling those of 'Lenore' in G. A. Bürger's well-known ballad of that title (translated by Sir Walter Scott). So soldiers, during and after the dangers and strain of active warfare, may be restless and call out in their sleep owing to exciting or terrifying dreams, as described by Lueretius and Shakespeare.

F. W. Mott, indeed, in his paper on the 'Psychology of Soldiers' Dreams',<sup>7</sup> in which he gives the appropriate quotations from Lueretius and Shakespeare, has pointed out that fear, terror, and horror, connected as they are with the fundamental instinct of self-preservation, are at least just as likely to be represented in dreams as sexual ideas and emotions. The latter are connected with the important instinct of reproduction (propagation of one's kind and survival of the species), but the instinct of self-preservation is probably still more basic and still more dominating. Both are, of course, especially powerful when the highest mental guidance is



impaired, and when subconscious influences are allowed more or less uncontrolled play.

In whichever way one regards it, whether from the point of view of ordinary human experience or from that of theoretical probability, the Freudian teaching that nearly all dreams have a sexual explanation is most unlikely to be true, or the element of truth in it is so exaggerated as to appear preposterous.

I do not believe that the elaborate Freudian explanation of dreams and morbid ideas by symbols is justified in the majority of cases by actual facts. Most persons do not usually think in symbols, nor do they usually dream in symbols. But for those who seek a cryptic explanation on any subject, and by a kind of infatuation or self-suggestion believe that they have found one, no gulf in their line of argument is too broad to bridge over, no mouthful of improbability is too large to swallow, in order to convince themselves that they have proved the correctness of their arguments. Witness the futile, though sometimes at first sight plausible, arguments and the wasted time (in searching for cryptographic clues, etc.) of those who set out to prove to others—after having almost convinced themselves—that the plays of Shakespeare were the work of Francis Bacon.\* There are certain old Italian medals and plaques, cast in bronze during the sixteenth and seventeenth centuries, and perhaps later, which represent a fanciful profile portrait, so made that, on careful examination, it resolves itself into a number of *phalli*. The whole portrait (possibly originally devised as an 'apotropæic' amulet for averting the 'evil eye') is made up of these phallic emblems skilfully pieced together so as (all of them together) to represent the portrait in question. Several minor works of art, if they can be thus styled, of various periods are in existence in which either phalli or death's heads† or other symbols or emblems have been purposely concealed

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\* We have not yet heard the end of these discussions. If Shakespeare *could not* have written the plays, and if Bacon and other Englishmen *did not* write them, and if, after all, they were not 'made in Germany', who then did write them? Why, it was Erasmus of Rotterdam, of course! He wrote them in Latin, one of them every night, during part of his visit to England, and gave them, as a souvenir of his visit, to his friend, Sir Thomas More. When the latter was executed, the manuscripts passed, somehow or other, into the Bacon family, and, later on, Lord Bacon and Shakespeare made them topical and dished them up in English for the English court and the English people. No wonder that they contain echoes of the epigrams of Pallas and the Greek Anthology that Erasmus so much admired! Oh, but what about the proof? The proof is a 'cryptic' one, relying on cryptograms and symbols, but it is unfortunately not yet completely worked out!

† Here I might refer also to the hidden 'death-mask' which it has been claimed was purposely included in the design of certain postage stamps issued in Serbia (1904) not long after the political murder of King Alexander I and his queen Draga (1903). The 'death-mask' is said to resemble the features of the murdered sovereign. The stamps in question, commemorating the coronation of the royal successor, King Peter I, were engraved by Louis Eugène Mouchon, a Parisian artist well known in connection

by the artist, who has evidently taken a delight in his skill in this direction. There have been collectors and archæologists, however, who have sought to find a *cryptic* phallus, or phallic signification, in most ancient (primitive) monuments and customs. Some of these investigators of origins may, indeed, have been said to have serpents and phallic emblems 'on the brain'. Similarly, some followers of Freud seem to have sexual explanations for almost everything, and sexual symbolism 'on the brain'.

The sexual instinct doubtless plays an immense part in the conscious and subconscious life of most individuals, but there are many other *driving motives in life*<sup>8</sup> besides those connected with sex, not to mention those very powerful ones—rivalry, resistance, and fear—connected as they are with the instinct of self-preservation. In the relatively primitive mental eyes of the ancient world, as I have already pointed out, 'life was constituted' not merely by sexual enjoyments and emotions, but also doubtless (as now) by interesting occupations, professional work, ambitions and aspirations, eating, drinking, hunting, social amusements, games of various kinds, etc.

Is there any way of reconciling the Freudian teaching as to the sexual explanation of dreams (and human active life generally) with other considerations such as those I have alluded to? Yes. There is one, I think—namely, by arbitrarily altering the definition of such terms as 'love', 'libido', etc., so as to make 'love' include almost every desire and passion, almost all psychical force, every thought or idea which activates life—in fact to make of it a kind of 'joy of life', '*élan vital*', a vital influence pervading everything, whatever human beings do or busy themselves about (*quicquid agunt homines*). This is, indeed, what, as it seems to me, Jung has done. Witness the following passages from his writings:<sup>9</sup> "All psychical phenomena can be considered as manifestations of energy in the same way as all physical phenomena are already understood as energetic manifestations.

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with the production of medals, plaques, postage stamps, etc. They became known as the 'death-mask stamps', and the whole issue was quickly withdrawn by the Serbian government, but not before a great number had been circulated, and specimens can still be easily obtained from the dealers. The 'death-mask' is seen only when the stamps are turned upside down. Harry de Windt (*Through Savage Europe*, London, 1907, p. 164) alluded to the subject as follows: "Only a week after his arrival Peter sustained a severe shock in connection with the Jubilee stamp which was struck in commemoration of his coronation. The stamp bears the heads of the present ruler and his ancestor, 'Black George', and at first sight the clever device of some revolutionary artist is unnoticeable. But turn it upside down, and the gashed and ghastly features of the murdered King stand out with unmistakable clearness—just as they appeared when Alexander and his consort were discovered in the grey dawn of that summer's morning in the gardens of the old Konak. Needless to state, the issue was at once prohibited". My own opinion (F. P. W.) is that the presence of the so-called 'death-mask' was a mere chance, though certainly a strange coincidence—a curious and undesired by-product of human art, analogous to a *lusus naturæ*, or extraordinary effect produced in Nature's workshop, as when a pebble resembles a human head or a rock resembles a toad or a bird or a pulpit.

... This energy is subjectively and psychologically conceived as desire. I call it *libido*. . . . From a broader standpoint libido can be understood as *vital energy in general*, or as Bergson's *élan vital*. . . . By libido I understand very much what antiquity meant by the cosmogenic principle of *Eros*—in modern terminology simply *psychic energy*".

Truly all this is literally making 'no end' of love; for according to it everything is love, and it reminds me of the following motto or 'posy' engraved on an old finger-ring:—

" Like to this sirkell round,  
No end to love is found."

There is, I believe, a real element of truth in all this, in so far as (to a certain extent) superfluous sexual force may (by some process of metamorphosis, analogous to transformation of ordinary physical forces, according to the law of conservation of energy) be diverted into and 'activate' (? harmonic action) other and useful channels, so as to increase the quantity and quality of the physical and mental outputs in other directions. This consideration, by the way, likewise helps to explain some of the beneficial effects of work and occupation on the mind and body<sup>10</sup>—effects that have been admirably pointed out by Thomas Carlyle in the enthusiastic encomium on work and labour included in his *Past and Present*, which was published in 1843. Sir William Osler, in equally fine language, maintains the value of work in his Address to Students of Yale University (1913), in which he quotes Carlyle's sentence: "Our main business is not to see what lies dimly at a distance, but to do what lies clearly at hand". This does not mean, of course, that man should not live to some extent for the future. Most men derive pleasure from actively striving after results they hope to obtain in the future. The pleasure derived from hopeful endeavouring to obtain is often greater than the pleasure derived from actual possession. But I must leave off here before I am tempted to enter into another discussion which has little to do with my main subject.

### POSTSCRIPT.

In the above writing I have hesitated in describing the play of dream-like phantasies on going to sleep (including 'hypnagogic hallucinations') as *quite* normal. Some persons of course are aware of none. Others, like myself, are aware of them at times, but not always, and their occurrence may be favoured by preceding mental excitement, or by mental stimulation, as for instance by tea, coffee, or certain toxic conditions connected with the alimentary canal. In my own case, it frequently happens that when sitting in the evening reading or studying I begin to doze. The scene changes, and I hear



various sounds, generally someone speaking to me, or perhaps I hear myself addressing someone\*—almost always on trivial, everyday, not disagreeable, subjects. For instance, someone may be asking me: "What time did you say?" or, "Have you left your gloves?" The scene varies; sometimes it may be the foot of a staircase very familiar to me. The associated general sensations are usually pleasurable, and there is a feeling of *bien-être* (*euphoria*). Sometimes there is, however, an accompanying disagreeable oversensitiveness to *real* sounds (hyperacusis), as, for instance, when a person is actually talking in the same room, and there may be sensations of discomfort on being drawn back to ordinary wakeful life again.† Sometimes, on commencing to doze, my thoughts remain (wandering) on what I have just been studying, and on waking up I find to my annoyance that I have only imagined myself to be still studying, and that in reality I have got no further on with my work (i.e., in reading a book) than when I commenced to doze. Sometimes, however, dozing or sleeping after studying has, as is well known, the effect of making problems of various kinds easier to solve, or of making one's work become less difficult to finish (the subconscious mind having adapted itself for that purpose during the interval of sleep).

The 'rapid play' of phantasies on commencing to 'doze off' seems sometimes very remarkable, and reminds me very much of what I have observed in patients with 'busy' delirium tremens, only

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\* On these occasions I may have sufficient reasoning power left to conclude (from the memory of frequent previous experiences) that I am commencing to doze off over my work, and by a vigorous effort of the will I can sometimes shake the sleep off, get up from my chair, walk about, and then go on with my work again. I do not always identify the voices speaking to me with special individuals, though I feel that I could if I were to try. But this is true to nature in regard to myself, as the following occurrence shows. One night during the war I was walking home to Harley Street by Market Place, near Oxford Circus, thinking of something. There was little light, owing to the danger of air-raids. Suddenly I felt a rather violent hand on my right shoulder, and thought that some old friend of mine must be playfully disturbing my thoughts in that way. I did not trouble to look round, but the next moment a violent tug at my watch-chain roused me up. The watch-chain was gone (fortunately leaving the watch in my pocket), and a man was running away several yards in front of me. I gave chase, and shouted "Stop thief" at the top of my voice. The chase was taken up by others, though I temporarily lost sight of the man. Someone was soon caught, who had many convictions to his credit in the police records, but he had not my watch-chain in his possession when he was caught, and, as the first thing I saw on this occasion was the back of a man running away, I could not swear that he was the man who seized my watch-chain. He was, therefore, discharged, somewhat to the annoyance of the special constable who had caught him. Strangely enough, several months later, the man in question, I think, whom I had seen in the dock, reappeared as a patient (though I did not at first recognize him). I took some blood from a vein to try the Wassermann reaction, but he did not like this and nearly fainted, and, to my annoyance, did not reappear at the hospital to hear the result, and for further examination and treatment; he seemed also to have given a wrong address. I must apologize for having in this footnote wandered away from my main subject.

† It has occurred to me, as it doubtless has to very many others, that dying patients may sometimes feel anything but gratified on being temporarily dragged back to earthly life by hypodermic injections of strychnine, ether, and such-like.

that my play of phantasies appears to me kaleidoscopic, whereas that of patients with delirium tremens is usually what might be termed *kakeidoseopic*.

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- <sup>2</sup> NIETZSCHE, *Human, all too Human*, ii, 27 *et seq.*
- <sup>3</sup> JUNG, *op. cit.*, 28.
- <sup>4</sup> JUNG, *op. cit.*, 22.
- <sup>5</sup> Cf. WEBER, F. PARKES, "A Note on Dreams", *Practitioner*, 1918, c, 472-7.
- <sup>6</sup> *Ibid.*
- <sup>7</sup> MOTT, F. W., Psychiatric Section of the Royal Society of Medicine, 1918, Jan, 8 (*Lancet*, 1918, i, 169).
- <sup>8</sup> Cf. ARMSTRONG-JONLS, *Practitioner*, 1917, xcviii, 216.
- <sup>9</sup> JUNG, C. G., *op. cit.*
- <sup>10</sup> WEBER, F. PARKES, "Exercise, Work, Rest, and Sleep: Comparison of Sayings", *Practitioner*, 1918, ci, 146.

## A CASE OF ENCEPHALITIS LETHARGICA INVOLVING CHIEFLY THE CEREBRAL CORTEX.

By GEORGE A. WATSON, RAINHILL.

IN the majority of the cases of encephalitis lethargica previously described, the main incidence of the disease has fallen upon the brain stem. The following case appears to resemble so closely clinically, and in many respects pathologically, the interesting cases of this disease recently described by Dr. Farquhar Buzzard<sup>1</sup> in which the *cerebral cortex* was chiefly affected, that it seems worthy of being recorded.

Although I saw the case several times myself, I am indebted to Drs. Cowen, Reeve, and Gott for the notes upon which the clinical history is founded.

**Clinical History.**—E. J., female, age 28, single, of no occupation. Admitted to Rainhill Asylum, April 18, 1918. Her father is a patient in Lancaster Asylum at the present time.

On admission she was in a condition of agitated melancholia. She had an extensive wound across the throat, self-inflicted with a razor nine days previously. She was in poor health and very anæmic, but with no signs of cardiovascular disease. She had complained of headache and inability to sleep for some weeks, and said she cut her throat because she feared she was becoming insane.

Two days after admission the patient tore open the wound in her throat and lost a good deal of blood, and had some slight rise of temperature after this. The wound in her throat gradually healed, but she remained very anæmic and improved but little mentally, being often very agitated and actively suicidal. From August 21 to 23 she vomited several times, and appeared to be ill. She improved somewhat until October 19, when she complained of pain in the back and down the left thigh, limped in walking, and became confined to bed. She remained in much the same state until December 24, when, after being visited by her friends, she suddenly lost speech, and seemed unable to utter any sound beyond a monotonous 'Ah, ah!', although she appeared to understand what was said to her. The right side of the tongue was apparently paralyzed, and she was unable to protrude it. This inability to speak remained until the death of the patient, but at no time was there any difficulty in swallowing. At this time she lay in bed in a drowsy, disinterested state, and seemed very ill.

The word 'lethargic' aptly describes her general appearance, but she could be roused to give fairly accurate responses. She was somewhat difficult to examine satisfactorily, but by January 4 the paralysis had undoubtedly extended. There was complete right hemiplegia affecting the face, arm, and leg, with insensibility to pin-pricks on the same side (including the right half of the tongue and the right side of the chest and abdomen), excepting over a patch in the centre of the groin, a small area over the upper fibular region, and the sole of the foot. The knee-jerks were brisk, especially the right: tendon-jerks of the right arm brisk: no clonus. The right plantar reflex was absent: on the left side a flexor response was obtained: abdominal reflexes were absent on the right side. There was no squint, but the left eyelid drooped slightly. Optic neuritis of medium intensity was present at this time, but there was no apparent deafness. On January 11, one week later, marked wasting of the muscles of the right arm, forearm, and hand was noted: also of the left calf and thigh, although there appeared to be no definite palsy of this limb. The patient died exhausted the next day.

The temperature was subnormal throughout this last illness. The skin generally became markedly pigmented some months before death, but there was no rash, and no ulceration about the mouth. Though constantly drowsy, she retained consciousness throughout, nor did convulsions occur at any time. On December 26, blood-films were examined, but these showed no abnormality beyond an excess of leucocytes, especially of the polynuclear and large hyaline varieties.

It is not easy to date exactly the commencement of the last illness. Although the patient had attacks of vomiting in August, it was not until October 19 that she was noticed to limp in walking, and not until December 24—twenty days before death—that she became afflicted with loss of speech and right hemiplegia.

A tentative diagnosis of cerebral tumour was first made, but later the diagnosis of encephalitis lethargica was suggested by Dr. Cowen.

**Post-mortem Examination.**—The body was poorly nourished, and there were slight bedsores on the hips and sacrum. The lungs and all the solid viscera were much congested, but otherwise normal. The heart was moderately dilated, but there was no valvular lesion: the larger arteries were normal.

The brain was of about average female size and complexity. There was slight excess of clear subdural fluid. The pia-arachnoid was intensely congested generally, but there was only slight and patchy macroscopic effusion of blood into and below this. The veins were greatly engorged, but there was no obvious thrombosis of these or the sinuses. The cerebral arteries appeared normal to the naked eye.

and showed no signs of thrombosis. There was no flattening of the cerebral gyri; the brain generally was soft. In the fresh specimen a large area of recent softening was seen in the left hemisphere. The softened area involved about the lower two-thirds of the central gyri, the extreme hinder and lower part of the subfrontal region, the extreme hinder part of the orbital surface external to the olfactory tract, the whole of the insula except its extreme anterior end, all the brain substance between this and the lenticular nucleus, and the whole of the putamen except its anterior fifth or so; but not the globus pallidus (*Figs. 1, 1a*). In the fresh specimen the affected area was very soft,



FIG. 1.—Drawing of part of the left cerebral hemisphere. The site of the softened area, as seen macroscopically, is heavily shaded.

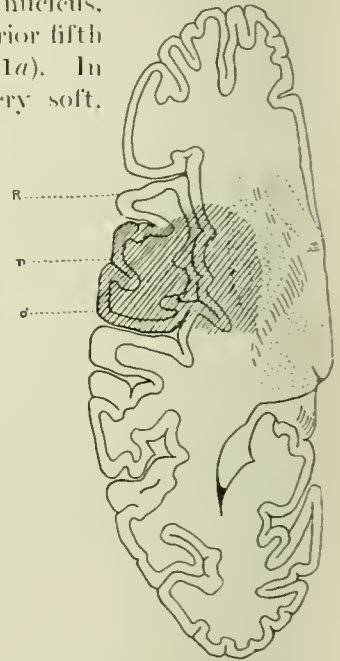


FIG. 1a.—Drawing of a cross-section of left cerebral hemisphere at the level indicated by the dotted line in *Fig. 1*.

*n* The sulcus centralis; *O*, *O*<sup>1</sup> The sulcus postcentralis; *r* The sulcus frontalis inferior;  
*R* *R*<sup>1</sup> The anterior Sylvian rami.

especially in the temporal, insular, and lower central regions. When stripping was attempted, the membranes were adherent over the softened area, and the colour of the surface was a pale yellow tinged with red in places. After the hemisphere in the hardened specimen was sectioned, the cortex of the affected parts appeared somewhat swollen, and numerous fine streaks of intensely congested vessels were visible, but there was no macroscopic hemorrhage. There was no similar affection of any part of the right cerebral hemisphere, nor of the cerebellum, pons, or medulla. The membranes of the spinal cord were congested, but the cord itself appeared normal to the naked eye.



**Microscopical Examination.**—*The Cerebral Hemispheres.*—In all parts examined, but especially in the softened area, the membranes are thickened and infiltrated with cells of various form and staining reaction. The vessels have thickened walls and are intensely engorged. Here and there are small hæmorrhages both into the substance of the membranes and below them. Some veins contain clots—hyaline or fibrinous—but these rarely occlude the vessels completely. In places, organizing thrombi are seen in the arterioles.

The appearances of the brain substance in the softened area differ somewhat in different parts, but the most striking general features are (1) the enormous increase in vessels, and (2) the great cellular proliferation. The vessels are mostly thickened, tortuous, and varicose, and part of the wall of many of them has a hyaline appearance. The cellular proliferation may be confined to the neighbourhood of a vessel (*Fig. 2*), but in the most affected parts this proliferation has spread widely into the surrounding tissues. It involves chiefly the veins and capillaries, but the arterioles have not escaped. Although numbers of lymphocytoid cells, plasma cells in various stages of formation, and pseudoplasma cells are seen, the majority of the cells are of the polyblast, epithelioid, and reticulate types. The predominating cells show great variety in shape and staining reaction, both of the cell body and nucleus, and many have two nuclei.

Numbers might be described as polyblast-epithelioid—intermediate forms between polyblast and epithelioid cells—which suggest that the latter are derived from the former. Few cells are very definitely granular. It is obvious that these cells have arisen mainly from proliferation of the cells of the adventitial coat of the vessels. Neuroglia proliferation is not a prominent general feature, although here and there, and chiefly in the outer layers of the cortex, collections of large fibril-forming 'glia' cells are seen, showing some differentiation

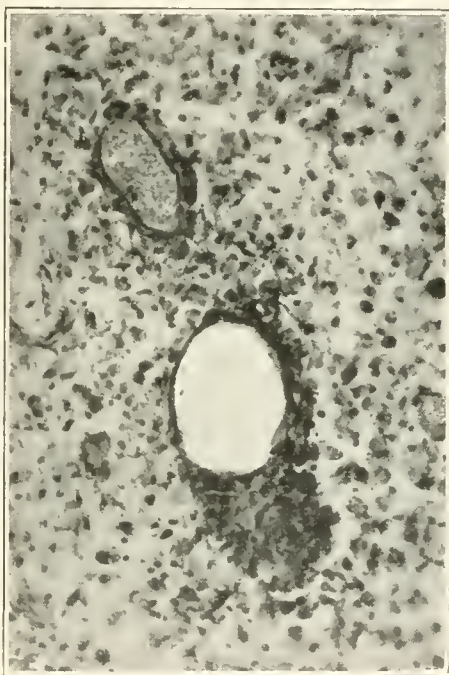


FIG. 2.—Left precentral gyrus; grey matter; cellular proliferation, most marked in the neighbourhood of vessels.

of their processes into fibrils. It does not appear, however, that the cells of the inflammatory reaction have arisen to any great extent from neuroglia cells. The vascular endothelium has also taken a part, though not an extensive one, in the reaction. In some instances proliferated cells of this coat can be seen projecting into the vessel or actually lying free within it.

The veins and capillaries are intensely congested, and there are small hæmorrhages around the vessels in places; but these are not numerous anywhere excepting in the putamen, and in parts of the precentral gyrus, where the hæmorrhages are larger and have torn up the tissues to some extent (*Fig. 3*). A superficial appearance of hæmorrhage has, however, often been produced by blood-cells which

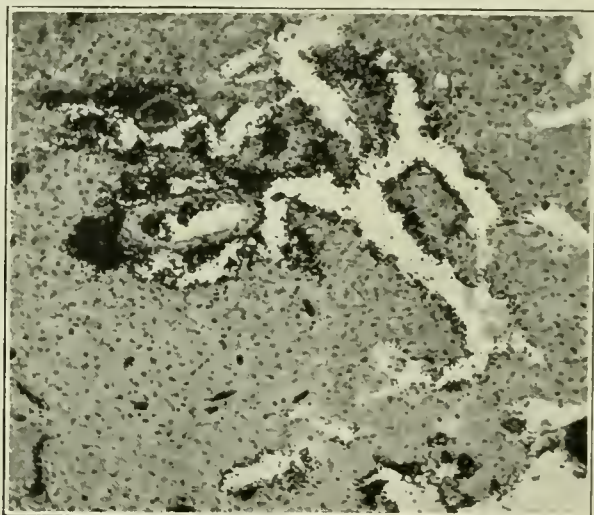


FIG. 3.—Left postcentral gyrus: white matter; hæmorrhage and rupture of tissues.

have come over with the knife in the process of section cutting. Some veins in both the grey and white matter contain clots—hyaline or fibrinous—which usually only partially fill the vessel. In places, also, organizing thrombi are seen in arterioles. A marked feature is the presence in the neighbourhood of many vessels of rarefied sieve-like areas (*Fig. 4*). These frequently contain an amorphous deposit amongst which are scattered proliferated cells. This deposit in some instances forms a fairly regular ring around the vessel; in others the vessel is only partially surrounded by it, whilst in still others it is more irregularly arranged, and spreads into the surrounding tissues some distance away from the vessel. The deposit



stains deep mauve with toluidin blue, a lighter mauve in van Gieson preparations, and brownish orange with pyronin-methyl green. It occurs chiefly about the vessels of the white matter, more rarely in the grey, but occasionally it is seen around a vessel just entering the cortex from the pia. It appears to be an exudate of some kind, for at times similar-looking material is seen within a vessel. In places these sieve-like areas have almost the appearance of actual cavities.

In addition to the above changes, others have occurred in certain parts. Areas of what seem to be partial necrosis are seen where the cells of the inflammatory reaction are themselves in process of dissolution. In such areas there are much darkly-staining debris and many palely-stained cells of various kinds, or fragments of these and nuclei, together with mulberry-like bodies which are probably degenerating cells. The greater part of the insula shows this condition. Whilst in some places the cells of the reaction have the ordinary appearance, in others either one or two broad bands or streaks of degenerating cells are seen—in the lower part of the cortex chiefly. In still other places these occur as isolated clumps. Similar streaks or clumps are found in the neighbouring sub-frontal region, and, more rarely, clumps of the same change in parts of the precentral gyrus. They occur only in the grey matter, and there is no sign of hæmorrhage around the areas; but where they are present, many small vessels, both in the pia and the cortex, which appear to be arterioles, contain organizing thrombi, wholly or partially occluding the vessel.

Mention may now be made of the distribution of the lesion in the softened area and of the condition of the nerve cells. The variability in the intensity of the disease process in different parts is shown both by the patchy character of the inflammatory reaction, and by the state of the nerve cells. Even in the same section, in one part the whole depth of the grey matter is fairly equally affected by the vascular and cellular increase, whilst in an adjacent part the

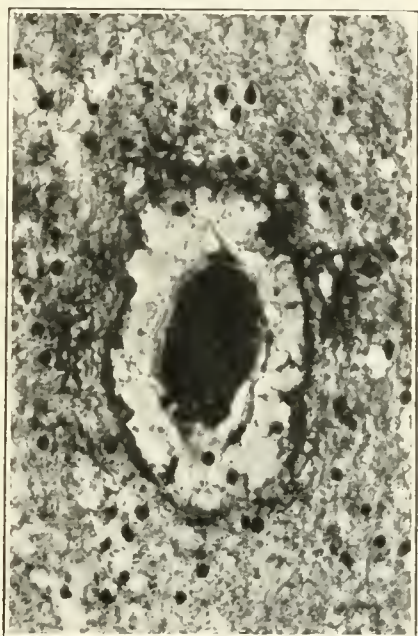


FIG. 4.—Left postcentral gyrus: white matter; perivascular sieve-like area containing exudate.

upper layers of the cortex are comparatively little involved, and the hyperplasia occurs chiefly as a broad band in the deeper layers (*Fig. 5*). In fact it is always most in the latter situation, where the anastomosing network formed by the short cortical arteries is richest, and where also there is probably some anastomosis between these vessels and branches of the long medullary arteries. It must be admitted, however, that in certain parts the proliferation is very marked in the subcortical white matter also, although here it is usually more diffuse than in the grey.



*Fig. 5.*—Strip of cortex from the middle of the left precentral gyrus. In this situation the inflammatory reaction has affected the entire cortex fairly equally.

The nerve cells in all parts of the region of softening are grossly affected, especially those of the lower cortical layers. In places they are unrecognizable, or stain so faintly as to be scarcely visible. Their condition varies with the intensity of the inflammatory reaction, and is always worst below the level of the granule layer, where this reaction is greatest. There is also considerable variability of implication in different parts of the gyri. In the subfrontal and lower central regions the reaction is most marked and generalized along the bottoms and sides of the gyri, and few nerve cells can be seen in those situations, whilst along the apices and flat surfaces the hyperplasia is much the greatest in the deeper layers, and the smaller nerve cells in the upper layers have remained in comparatively good condition. On the other hand, in the middle of the precentral region the inflammatory process has affected all parts of the gyrus and all levels of the grey matter more equally, excepting the lower half of its posterior wall, and it is only here that practically any nerve cells can be seen. In fact, in no other part of the softened precentral gyrus examined but this could any Betz cells be found, and even here these are

so ghost-like that they are only just visible.

The postcentral gyrus about its middle is less affected than the precentral, and its flat surface and posterior side less than its anterior side. The patchy character of the lesion is also demonstrated by the

fact that while the postcentral gyrus is on the whole less affected than the precentral, a small portion of the parietal region, for a variable distance behind the sulcus postcentralis, is severely involved, and a narrow strip of comparatively healthy cortex, containing nerve cells much less changed, intervenes in places between this severely involved region and the postcentral gyrus. The softened area is thus not strictly bounded posteriorly by the sulcus postcentralis. The condition of the upper part of the central region, where there is no obvious softening, will be described presently.

In the putamen there is an enormous amount of vascular and cellular increase, with great destruction of nerve cells, hemorrhages, thromboses, and perivascular sieve-like areas. The globus pallidus, internal capsule, and optic thalamus are little affected.

In the temporal region the changes appear to be older, or at least less acute than in other parts of the softened area. There are great numbers of vessels with thickened walls, but, on the whole, less cellular proliferation beyond the immediate neighbourhood of the vessels, and the latter are not very greatly congested. The nerve cells, however, are much degenerated, and stain very faintly.

About the upper end of the central gyri, where there is no obvious softening, the membranes are moderately thickened and infiltrated, and the vessels very congested. The vessels throughout the brain substance are much less numerous than in the softened area; there is, however, some adventitial proliferation and increase of 'glia' in the neighbourhood of the vessels. The latter are intensely congested, and some are partially plugged with hyaline clot. In the lower part of the grey matter, and in the white, are a few small sieve-like areas. There are marked changes in the nerve cells; many of the small and medium pyramids, and the polymorphs, are swollen and disintegrated, but the larger pyramids are less affected. The Betz cells are all grossly altered: some are swollen, others shrunken, with ragged edges and defective processes; the nucleus is often indistinct, and is commonly displaced towards the apex or side of the cell. The cytoplasm stains more or less diffusely; there are seldom well-defined Nissl bodies, and the greater part of the cell body usually has a homogeneous and somewhat glassy appearance. The satellite cells are increased in numbers, especially at the level of the medium and larger pyramids, but to a less extent about the Betz cells. On the whole the morbid changes are more marked in the precentral than in the postcentral gyrus.

In the upper, middle, and lower central regions of the opposite hemisphere—the right—the appearance of the vessels is much the same as in the upper central region of the left hemisphere, but there is more small-celled 'glia' proliferation. The condition of the nerve

cells is also much about the same, with the exception of the Betz cells. None of these latter are normal; many show chromatolysis of the axonal type, with fairly good Nissl bodies about the apex of the cell; others stain darkly and diffusely, and appear to be in an earlier stage of the same morbid process as that which has so grossly altered the remaining Betz cells of the opposite hemisphere (*Fig. 6*). The upper part of the central region on this side is more affected than is the middle and lower.

In the prefrontal, the greater part of the parietal, and in the calcarine and hippocampal regions of the left side—the side on which

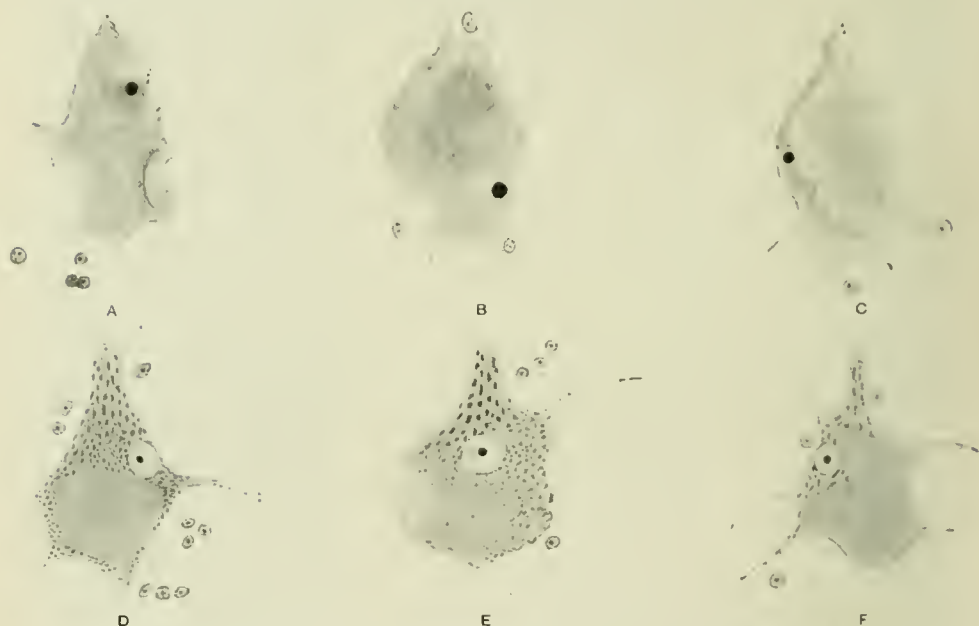


FIG. 6.—Drawings of Betz cells. The upper three (A, B, C) are from the top of the left precentral gyrus, which was not obviously affected by the softening. The lower three (D, E, F) are from the same situation in the opposite hemisphere.

the softening occurred—there are signs of meningitis and a few small hæmorrhages; also great congestion of vessels, some of which contain hyaline clots, and a few small sieve-like areas in the white matter. There is, further, a certain amount of adventitial proliferation, but to nothing like the same extent as in the softened area. Much degeneration of nerve cells, however, exists, with considerable satellitosis, most marked in the prefrontal region.

*The Medulla and Pons at various levels.*—The membranes are thickened and infiltrated, and the vessels in all parts very congested. Some of the vessels show hyaline thrombi, and there are a few small hæmorrhages in the medulla. There is some adventitial



proliferation, some 'glia' proliferation, especially at the periphery, and much infiltration of small round cells generally. These changes are more marked in the medulla than in the pons. Scattered nerve cells in almost all groups show more or less degeneration, but no one nucleus seems much more affected than another.

*The Spinal Cord at Various Levels in the Cervical, Dorsal, and Lumbosacral Regions.*—There is considerable thickening of membranes and vessels throughout, but no great amount of active cellular proliferation. The vessels are intensely congested, but few thrombi or hæmorrhages are seen. Much small-round-celled infiltration has occurred in the grey and white matter, with proliferation of large 'glia' cells, especially about the periphery of the cord, but there is no definite sclerosis of any particular tract. Regarding the anterior horn cells, some of these in the cervical region appear fairly normal, but others are stunted and stain diffusely; the lateroventral and laterodorsal groups are most affected, and particularly on one side. In the upper and mid-dorsal regions there is little affection of the cells of the nucleus motorius, but many cells of the nucleus dorsalis on both sides show moderate chromatolysis. In the lower dorsal region several cells of the lateroventral groups are grossly affected. In the lumbar and sacral regions there is degeneration of many cells with displacement of their nuclei in all the groups, but especially in the laterodorsal and retrodorsal on both sides.

*The nerve roots and posterior root ganglia* examined are very congested and show considerable cellular proliferation, and the latter some small hæmorrhages.

*The Cerebellum.*—There is little alteration in the parts examined, beyond congestion and slight meningitis.

No organisms of any kind were found in the tissues.

**General Observations.**—Although the condition has been termed 'encephalitis', it is really a widespread meningo-encephalo-myelitis affecting practically all parts of the central nervous system. But the chief stress of the lesion has fallen upon the left cerebral hemisphere, involving principally the lower part of the subfrontal region, the middle and lower central regions, the greater part of the insula, and the putamen, as well as part of the temporal region. Where it is most gross it consists of a great increase of vessels, with marked proliferation of the adventitial, and to a less extent of the endothelial, cells of the vessel walls, together with neuroglial proliferation, thrombosis, hæmorrhage, softening, and much destruction of the nervous tissues. The lesion, however, even in the parts most affected, is patchy in the intensity of its distribution, and also does not seem to have been all lit up at the same time; in some places the reaction appears to be acute, in others less acute, in character. In the soft-

ened area the picture is a very complex one, for, besides the primary inflammatory process, there is a secondary one called forth by the destruction of the nervous tissues and the attempt at removal of the degeneration products. This latter is evidenced by the enormous numbers of phagocytic cells of the epithelioid and reticulate types.

The case differs from those of acute encephalomyelitis described by Cleland and Campbell<sup>2</sup> as occurring in a recent Australian epidemic—clinically, in that it was of longer duration and also presented signs of definite paralysis: and pathologically, in that the changes in the nervous system were more gross, areas of destructive softening being present. On the other hand, the case closely resembles clinically those described by Farquhar Buzzard,<sup>1</sup> the chief symptoms being lethargy, with hemiplegia, hemianæsthesia, and aphasia. Pathologically it seems to be of a similar nature. The chief difference between the morbid findings in this case and in the majority of those previously recorded appears to be that here the changes were more of the so-called hyperplastic type than the hæmorrhagic. Hæmorrhage was not a particularly prominent feature, and this may perhaps be partly accounted for by the rarity of complete venous thrombosis, and perhaps also by the absence of a predisposing fragility on the part of the blood-vessels, owing to the comparative youth of the patient.

I agree with Dr. Buzzard in thinking that 'encephalitis lethargica' is not a new disease; nor probably is its chief incidence in the cerebral cortex very uncommon. I can recall several cases from my own experience which were clinically and pathologically very similar to that above described. I believe, however, that the condition is apt to be overlooked.

With regard to the view that 'encephalitis lethargica' is associated in some intimate causal manner with influenza, the only observation which can be made in connection with this case is that a severe epidemic of influenza occurred on the female side of the institution during the months of September and October, 1918. Over 200 patients and 70 nurses were attacked, and there were many fatalities. The disease continued more or less sporadically until the following March, but the patient E. J. was not definitely known to have suffered from an attack at any time.

I am indebted to Miss A. B. Taylor for some of the drawings, and to Mr. F. J. Abram for the photomicrographs.

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#### REFERENCES.

<sup>1</sup> BUZZARD, E. FARQUHAR. *Lancet*, 1918, ii, 835.

<sup>2</sup> CLELAND AND CAMPBELL. *Brit. Med. Jour.*, 1919, i, 663.



## Short Notes and Clinical Cases.

### A CLINICAL NOTE ON THE OCCURRENCE OF HYPOTONIA IN DEMENTIA PARALYTICA.

By R. M. STEWART, PRESTWICH.

The following case of general paralysis of the insane is remarkable in that a very striking degree of hypotonia was accompanied by scarcely any other characteristic signs of tabes dorsalis.

**Clinical History.**—DVT. D., A.S.C., age 31, was admitted to the Neurological Department, B.S.F., on Aug. 14, 1918. He had contracted syphilis eleven years previously, but otherwise had enjoyed good health up to the date of his admission to hospital. He gave a history of having been knocked suddenly on to his back by the butt of a vicious ram one month previously. He complained of 'rheumatic' pains in the soles of his feet, and in his legs and fingers.

**Mental Functions.**—Perception: he recognizes objects and the movements associated with their use; there is no apraxia. He has auditory hallucinations at night. Memory and orientation normal. Content of thought: he shows a complete lack of insight into his condition, and imagines himself to be in good health; in comparison with others he thinks he is a very strong man and "could beat Jack Johnson". Emotional tone one of exaltation—marked euphoria. He is facile and docile in behaviour; habits clean.

**Nervous System.**—There is tremor of tongue and outstretched limbs, and coarse tremor of the lower facial muscles, with an accompanying loss of lines of expression. Speech and articulation: paraphasia occasionally; slurring and reduplication of syllables and words. Pupils moderately dilated and unequal in size; reaction to light and on convergence sluggish. Fundi normal. Cranial nerves normal: no nystagmus.

**Sensory Functions.**—No cutaneous anæsthesia. Pin-prick does not evoke discomfort except on the face, nor does bleeding occur in the analgesic areas. There is diminished sensibility to pressure pain on nerves and muscles of all four limbs. Joint sense normal.

**Motor Functions.**—Motor power normal: no muscular wasting. Tonus: a very marked degree of hypotonia exists, especially in the muscles of the back and lower limbs. It is possible for the patient

to flex either thigh acutely on the abdomen, at the same time keeping the leg extended. This deficiency of muscular tonus allows the patient to assume the most extraordinary postures without pain (*Figs. 1, 2*). Co-ordination normal; gait normal; no Rombergism. Reflexes:

abdominals brisk and equal; plantars, flexor response; bulbo-cavernosus reflex present; supinator-, biceps-, and triceps-jerks present and equal; knee-jerks exaggerated; ankle-jerks brisk; organic reflexes normal. Skull and vertebral column normal.

*Cerebrospinal Fluid.*—Clear; pressure increased; marked excess of albumin and globulin content; lymphocytosis. Wassermann reaction positive.

On the morning of Aug. 15 the patient had a 'fainting fit' lasting a few minutes. On Aug. 25 he was transferred to the psychiatric department, and here

the diagnosis of dementia paralytica was confirmed.

#### Remarks.

Hypotonia or diminution of muscle tone can be observed in different affections of the nervous system in which there is interruption of the short collateral fibres constituting the



FIGS. 1, 2.—Postures assumed owing to hypotonia in dementia paralytica.

spinal reflex arc, and of those forming the cerebellar arcs (anterior horn collaterals, and fibres arborizing around the cells of Clarke's column). Its occurrence in tabes dorsalis is well known, and is accountable for the abnormal postures into which tabetic limbs can often be placed. Not only are the muscles hypotonic in this disease,

but relaxation of articular ligaments can also be demonstrated, permitting of a wider range of absolute movement than is possible in the normal subject.

The combination of *tabes dorsalis* and *dementia paralytica* is not a very rare occurrence in asylum practice, and in the post-mortem room tabetiform lesions of the spinal cord can be found in about 50 per cent of patients dying from general paralysis. Nevertheless, the fully-developed symptomatology of locomotor ataxia is by no means common in general paresis, and, in the writer's experience, a marked degree of hypotonia is seldom seen.

In this case, the absence of Rombergism, ataxia, and sphincter trouble, and the preservation of the tendon reflexes, left but few data for establishing the presence of *tabes dorsalis*, although it must be noted that both cutaneous and deep analgesia—two of the most important diagnostic signs—were found over a very large area of the body. On the other hand, the patient's mental state and general appearance were quite characteristic of *dementia paralytica*. It must not be forgotten, however, that the mental and neurological signs of an apparently 'typical general paralysis' may be closely simulated by a syphilitic affection of the enclosing and vascular structures of the nervous system. This is especially the case where the progress of the malady is rapid, and the vigorous application of antisypilitic remedies may, in such cases, rapidly transform the clinical picture and even bring about an apparent recovery. It is to be regretted that no opportunity was afforded for observing the effects of salvarsan treatment on this patient.

Inquiries were made with a view to determining whether the patient, in infancy or in youth, had received training which permitted the adoption of the remarkable postures seen in the illustrations. It was ascertained that before the war he had been an able seaman, and no evidence was forthcoming that he had ever been a professionally trained contortionist.

The occurrence in this case of a marked degree of hypotonia along with normal postural sense and co-ordination would appear to indicate that the syphilitic virus exercised its effects in a most remarkably selective manner on the afferent system of spinal neurones, and it further shows that a profound hypotonia may be quite compatible with complete integrity of reflex and co-ordinated voluntary action.

## CEREBELLAR FITS OF THE HUGHLINGS JACKSON TYPE.

By DOUGLAS FIRTH, LONDON.

THE association of fits with cerebellar tumours is not uncommon. Two varieties have been described, in both of which the spasms are tonic in character and not clonic. The first variety is seen in unilateral cerebellar disease,<sup>1</sup> the homolateral limbs being most affected and adducted to the body, while the contralateral limbs are abducted. Limbs, trunk, and head show a 'screw-like' rotation from the side of the lesion to the healthy side, towards which the eyes are deviated. The second variety, described by Hughlings Jackson as occurring in lesions of the middle lobe, consists of "head retraction with arching of the back, flexion of the elbows, supination of the hands, and rigid extension of the legs with pointing of the toes".<sup>2</sup> In regard to this variety, however, Sir David Ferrier thinks that it is questionable if these phenomena are the direct result of cerebellar irritation proper.<sup>3</sup> In the following account it will be noted that the fits had mainly the characters of the Hughlings Jackson type, but there were some additional features which may be ascribed to the other cerebral lesions.

**History.**—The patient, a boy, age  $8\frac{3}{4}$  years, was admitted to hospital, Aug. 22, 1919, suffering from 'fits'. For eight months past he had been failing in health and losing flesh: but the first definite indication of illness was noted at the beginning of August, when he complained of nausea and was sick once. A week later he became somewhat lethargic, only rarely playing about like a normal child, and complained of headache, which was followed in a day or two by giddiness. On Aug. 20 and 21 a fit occurred each evening, and on the 22nd a fit at 11.30 a.m. was followed by three more before 3.30 p.m.; the boy was then brought to hospital. Vomiting had been noted each evening for a week. The past history was uneventful, the child having been confined to bed only once in his life, and then for measles. There was no history of tuberculosis in the family of either parent; but a brother, age 10, had died two and a half years previously from tuberculous peritonitis.

**Examination.**—The boy was lying comfortably in bed, fully conscious, and, when questioned, complained of frontal headache and nausea. The body and limbs were somewhat wasted, the skin dry

and harsh, and the eyes a little sunken. The tongue was coated with brownish fur, but nothing else abnormal was discovered in the digestive, circulatory, or respiratory system.

Examination of the nervous system revealed very little. The mental condition appeared normal, vision was not impaired, the pupils were active and equal in size, all ocular movements were good, and no nystagmus was present. The optic discs were white and the edges indistinct; no choroidal tubercles were found. The other cranial nerves were normal. Both hands showed a fine tremor, but no inco-ordination was noted, and there was no paralysis or weakness of the four limbs.

Of the reflexes, both knee-jerks were present, but weak; the ankle-jerks could not be elicited; the plantar reflex was flexor on both sides; and the abdominal reflexes were active and equal. There was some ataxia of the usual cerebellar type, but the boy did not tend to fall to either side in particular.

The urine contained no albumin or sugar. The temperature was normal and the pulse 88. The Wassermann reaction was negative; a slight reaction was given to P.T. by von Pirquet's test.

The first fit in hospital was reported on Aug. 24; and as time went on, the fits increased, not only in frequency, but also in severity and duration, and the vomiting became a pronounced symptom.

On Aug. 23, a fit lasting a few seconds was reported, and on the 30th, one lasting eight minutes was seen. At the onset of this fit the child cried out; the head was drawn to the right and tonically retracted throughout the fit. Twitching of the right facial muscles was followed by tonic contraction. The eyes were directed to the right, the pupils were equal and three-quarters dilated, and for the last two minutes of the fit there was regular nystagmus to the right. Tonic extension of all four limbs was present, the right arm relaxing first at the termination of the fit. The trunk showed a slight degree of opisthotonos throughout. After the fit, the knee- and ankle-jerks were absent, and there was slight rigidity of the right lower limb.

A day or two later another fit was observed. At the commencement, the head and eyes were turned to the right, with nystagmus to the right. The mouth was also drawn over to the right, and the right orbicularis palpebrarum tonically contracted; these phenomena continued throughout the fit. At the onset the right arm was flexed in tonic contraction and held close to the side, but after a few seconds it began to extend, this extension being accompanied by that of the other three limbs in tonic contraction. After five minutes, opisthotonos appeared, and, as it developed, the boy rolled over on to his right side, with marked head retraction; the feet were then



plantar-flexed with the toes pointed, this action being immediately followed by general relaxation.

A third observed fit commenced with rigidity of the right arm and leg in tonic extension, and over-action of the right side of the face. Extension of the left leg followed rapidly, and, in two minutes, extension of the left arm. Next, head retraction appeared, and was followed by opisthotonos. The left arm and leg did not remain tonically extended, but were slowly flexed from time to time, and after three minutes became flaccid. The divergence of the head and eyes to the right persisted throughout the fit, which lasted nine minutes.

The description of these three fits gives the salient features of the rest. In all those of which notes were made, nystagmus to the right was present; the termination was heralded by rolling over on to the right side; and the boy was unconscious during the convulsions. On Sept. 3 weakness of the right face and grip was noted; and by this time the boy had become more drowsy and the mental condition was deteriorating. On the next day a definite reaction was given to the subcutaneous injection of  $\frac{1}{16}$  mgrm. of O.T.

On Sept. 10 it was seen that a slight change had taken place in the onset of the fits. The head was turned towards the left side, while the eyes continued to turn to the right, and the right arm and leg were more affected by the tonic spasm than the left. In the intervals between the fits the right leg was markedly spastic, with greatly increased knee-jerk and positive Babinski's sign.

The fits showed a curious tendency to appear in groups: thus between Aug. 23 and Sept. 7, a period of sixteen days, fourteen fits were reported, one on Aug. 23, two on Aug. 30, two on Sept. 3, and nine on Sept. 5. Between Sept. 8 and 12 sixteen fits occurred, in groups of five, four, one, and six per diem, with only one day (the eleventh) free. As the number of fits was obviously increasing, the vomiting and headache persistent and distressing, and the general condition deteriorating rapidly, a decision was made to have recourse to operative measures with a view to relieving the intracranial tension. The risk of a subsequent tuberculous meningitis was appreciated, but it was evident that, if nothing was done, the boy would quickly succumb.

**Operation.**—On Sept. 13, Mr. John Everidge performed a right subtentorial decompression. On removal of the bone, no cerebral pulsation was seen, but after incision of the dura the brain herniated through the opening, and pulsation became normal. A finger introduced into the cerebellum did not detect any tumour.

After the operation the fits ceased, although the vomiting continued about once daily. In all other respects the results of the operation were most satisfactory until Oct. 4, when the temperature

began to rise and the child was drowsy; as time went on the vomiting became more and more persistent, coma gradually ensued, and death took place on Oct. 15.

**Post-mortem Report** (for which I am indebted to Dr. Stanley Wyard).—On the skull being opened, the membranes were found congested, and about the base they were much thickened, and showed considerable lymphoid exudate. The brain substance presented the signs of increased pressure—flattening of the convolutions and diminished depth of the sulci. Along the vessels lying in both Sylvian fissures were numerous minute tubercles. On section of the encephalon, three tuberculomata were discovered. One, about one-third of an inch in diameter, was situated in the anterior pole of the left centrum ovale, involving fibres from the frontal lobe only; those from the sensory motor area were unaffected. Two were in the cerebellum; one of these, about the size of a cob-nut, lay free in an abscess cavity in the right lobe of this organ, the other occupying its middle lobe. It was not visible on the surface, but when the cerebellum was removed from the pons, the mass was found bulging into the fourth ventricle and pressing on the upper and middle cerebellar peduncles. This tumour was about three-quarters of an inch in diameter, and was almost exactly in the middle line. Dr. Wyard was of opinion that the cavity in the right lobe of the cerebellum was recent in origin and was probably formed after the operation.

The lungs showed numerous scattered tubercles throughout. The pericardium was firmly adherent everywhere, and could not be stripped off the heart, at the base of which was a mass of caseous tuberculous material. The valves were normal.

The contents of the abdominal cavity, except for a few small tubercles on the surface of the liver, a small caseous mass in that organ, and a smaller mass in the right kidney, presented no pathological appearances.

**Pathogenesis of the Symptoms.**—Explanation of the symptoms is difficult owing to the multiple tumours present in the brain and cerebellum—especially as tumours of the frontal region often give rise to symptoms which suggest cerebellar lesions. The head retraction, opisthotonos, extension of the limbs, and pointing of the toes during the fits, as described by Hughlings Jackson, were undoubtedly associated with the tumour of the middle lobe of the cerebellum; but as this tumour was not directly affected by the operation, which only relieved pressure under the tentorium, and as the fits ceased immediately the intracranial tension was released, it would appear, as Ferrier has suggested, that such fits were due to the pressure of the tumour on the subjacent structures, of which there was no doubt, and not to any direct irritation of the middle lobe.

The tumours in the frontal and right cerebellar lobes may afford an explanation of the other features of the fits—the nystagmus and turning the head to the right, the facial symptoms, and the rolling over on to the right side at the end of the fit. These tumours did not give rise to fits *per se*; but when fits, originated by the pressure on the hind-brain, were in evidence, they exhibited additional stimuli, and produced ‘complicating’ symptoms.

Some of these symptoms would seem to be contrary to those usually described. For instance, in Stewart and Holmes’ case,<sup>1</sup> where a hæmorrhage affected Deiters’ nucleus, the patient turned on to the sound side. Now Ferrier and Turner<sup>1</sup> have pointed out that rotation from the side of the lesion and the taking up of a forced position on the side of the lesion are essentially the same thing; so it is possible to regard the attitude assumed here at the end of the fits as a ‘forced position’. The nystagmus—only present during the fits, a rare occurrence—was to the right. Nystagmus is present in the large proportion of cerebellar lesions, both to right and left, but the swing towards the side of the lesion is more ample and regular than to the unaffected side. Had the boy lived, nystagmus would probably have developed in the intervals between the fits, and to the left, that which showed being an early incomplete form of the common type.

“The symptomatology of the prefrontal lobes is essentially true of lesions of the prefrontal section<sup>3</sup> of the centrum ovale”;<sup>6</sup> so the presence of the frontal tumour suggests an explanation of the facial symptoms, and the turning of the head and eyes to the right. Similar phenomena have been described by Bruns<sup>7</sup> and Chouppé<sup>8</sup>—by the former in a case of hæmatoma indenting the left frontal lobe where the patient had slight paralysis of the right hand and face; and by the latter in one of tuberculous meningitis in which there was rotation of the head and eyes to the right. Here a superficial lesion, the size of a shilling, was found on the superior part of the middle frontal convolution in the left hemisphere.

When multiple tumours of the brain are present, it must always be a matter of great difficulty to allot the part each has played in the production of symptoms. While the boy was alive, the main group of symptoms during the fits was that described by Hughlings Jackson, and was recognized as such. After the post-mortem findings had been considered, the attempt was made, with some diffidence, to correlate the remaining symptoms with the other cerebral lesions.

Another instance of tonic spasms due to intracranial disease has been brought to my notice by Miss Noel Olivier, house physician at the Victoria Hospital for Children. They occurred at the termination of a case of tuberculous meningitis in a boy, age 5 years, who

was admitted with a history of five days' drowsiness and died twelve days after admission.

The record of the case shows nothing noteworthy in the course of the disease until twelve hours before death, when the onset of tonic spasms was noted. The boy was then deeply comatose, with increasing pulse and respiration rates, and, once the convulsions commenced, so frequent were the attacks and so short the intervals of relaxation that the boy was hardly ever at rest during the twelve hours during which they lasted. All the convulsions were of the same type, and were ushered in by a paroxysm of rapid, deep, rhythmic, grunting respiration, accompanied by sweating, and followed at once by rigid tonic extension of the upper and lower limbs.

The arms were held close to the side with the elbows extended, the forearms everted, the wrists palmar-flexed, and the fingers flexed. The lower limbs were rigidly extended; the ankle on the left side was extended and the toes were pointed, while on the right side dorsiflexion of the ankle was followed by extension. As the convulsion subsided it was possible to obtain marked exaggeration of both kneejerks, but that on the left side was especially active. Ankle-clonus was also more marked on this side. No clonic movements at all were observed. The trunk was extended, with slight opisthotonos, but the head was neither retracted nor drawn to either side. The face was very little affected except for over-action of the occipitofrontalis, causing wrinkling of the brow.

Each convulsion came on very rapidly, lasted five to ten minutes, and subsided gradually, the complete relaxation between the attacks only lasting three to five minutes. No definite position of the body was assumed during or between the attacks, although there seemed to be a tendency to lie on the left side.

Post mortem, the brain showed a well-marked tuberculous meningitis, with much dilatation of the lateral ventricles, which contained a quantity of turbid fluid.

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- <sup>3</sup> ALBUTT AND ROLLESTON, *System of Medicine*, 2nd ed., viii, 147.
- <sup>4</sup> FERRIER AND TURNER, *Phil. Trans.*, 1894, B, clxxxv, 719.
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- <sup>6</sup> FERRIER, *Albutt and Rolleston's System of Medicine*, 2nd ed., viii, 101.
- <sup>7</sup> BRUNS, *Deut. med. Woch.*, 1892, xviii, 138.
- <sup>8</sup> CHOUPE, *Bull. Soc. Anat.*, 1871, 2nd s., xvi, 380.

## A CASE OF CONCUSSION OF THE SPINAL CORD, RESULTANT ON A GRAZE BY A LIVE SHELL: WITH ESPECIAL REFERENCE TO THE PHENOMENON OF 'HETERÆSTHESIA'.

By T. GRAHAM BROWN, MANCHESTER.

THE following case presents points of interest apart from the fact that it is almost impossible to conceive a closer contact with a live shell without death.

Lieut. V., R.A.F., age 22, was acting as observer in an aeroplane which came back over the enemy's lines on April 6, 1918, after a reconnaissance. It was flying at about 8000 feet, and he was facing the tail of the machine, when he suddenly felt an "almighty crash"—an "enormous blow, like when he was wounded before, but much worse". Almost simultaneously, but actually a little later, he heard an explosion. He fell under his seat and found that he could not shut his mouth. He was badly winded, and "fought for breath and tried to think what had happened". At first he concluded from his difficulty in breathing, and from a difficulty in closing his mouth, that he was hit in the face. As his breath came back to him he began to doubt whether he was hit in the face after all. There was a general pain all over him which he could not locate. He next tried to touch his face with his hands, to feel for evidence of a wound, and at once found that his hands were limp and that he could not use his arms. With great difficulty he managed to get his gloves off and was able to raise his left hand to his face. He now decided that his arms were hit. There was a sensation in his hands "as if they were getting back feeling after being frost-bitten", and he thought they must have been frost-bitten shortly before, when he had to take off his gloves to handle the gun. But on looking at his hands he could see no sign of this. About this time the pilot evidently suspected that something was wrong, for he telephoned, "Are you hit, sir?" On landing, after being lifted out of his seat, he was at once placed on a stretcher, and taken to a casualty clearing station. He did not try to walk, but thinks that he could have done so.

At the Clearing Station it was found that his leather coat was marked across the shoulders by the driving-band of an anti-aircraft shell. A photograph of this coat was made, and it is reproduced



in *Fig. 1*. It will be observed that the marks shown are unmistakably those of a shell, and almost certainly produced by the grooved copper driving-band. It seems to me that the shell must have been travelling from the patient's left to right. The horizontal direction of the mark is somewhat unexpected. It is explained by the fact that he was leaning over the side of the machine at the time.

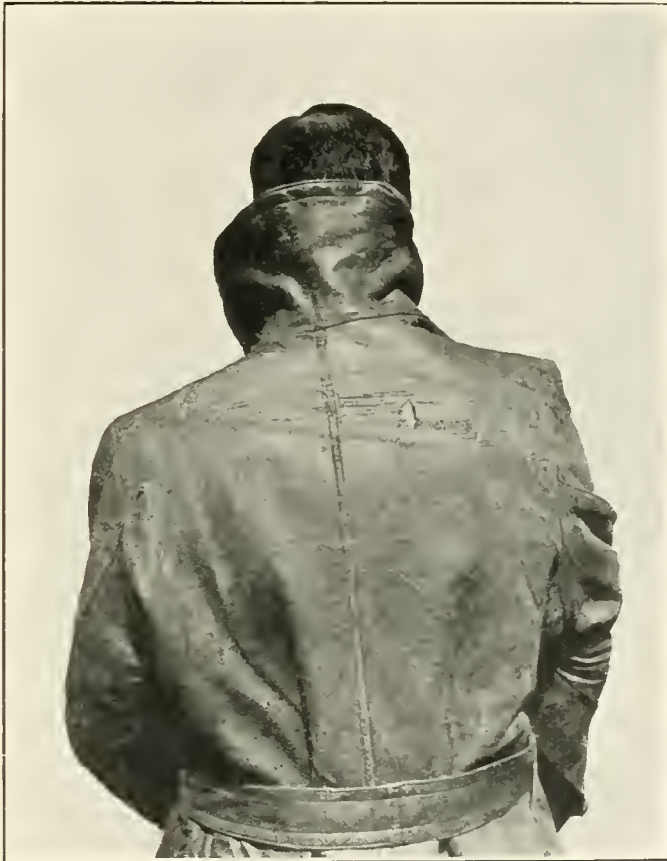


FIG. 1.—Photograph of aviator's leather coat, showing marks made by driving-band of anti-aircraft shell.

The hole in the leather lies directly over the internal border of the right scapula. It is worthy of remark that, until this was found, he had no idea that he had been hit on the back.

He was treated for two days at the clearing station, but is rather hazy about what happened to him there. Bruises on the back were treated in the ordinary way, and it was decided that no bones were broken. He was then transferred to the neurological department of the British Salonika Force, and admitted there on April 8.

**On Admission.**—It was found that the patient had great difficulty in moving his arms, the paresis being greater in the case of the right upper limb than in that of the left. His shoulders were badly bruised, especially over the upper halves of the two scapulæ. Across this region, and accurately corresponding with the marks on his coat, were a number of long parallel wheals. These were most marked over the internal borders and spines of the scapulæ and more on the right than on the left side. The skin was nowhere broken. There was a diffuse discoloration over both shoulders, as if from a severe bruise; and later on a similar discoloration was noticed under the right clavicle. The following facts, amongst others less essential, were observed at this time.

He complained of pain in the shoulder and neck, and of painful tingling in the upper limbs. Apart from slight nystagmoid movements of the eyeballs, in the extreme lateral positions, and a marked tremor of the protruded tongue, the cranial nerves were normal. The pupils were dilated.

With regard to sensation, there was little abnormal to be detected. Slight hyperæsthesia and hyperalgesia were present in the upper limbs, particularly in the areas of distribution of the eighth cervical and first and second thoracic dorsal spinal roots. This was more marked in the right than in the left limb. No area of anæsthesia or analgesia could be detected. The kinæsthetic sensations were apparently normal. There was no astereognosis. Compass tests were fairly accurate. Localization could not be tested. Lower limbs were apparently normal.

The most interesting sensory disturbance was the presence of 'heteræsthesia'. This is a phenomenon which was first observed in this department in cases of partial compression of the spinal cord, cerebral concussion, and skull concussion. It consists in this, that if a constant stimulus (such as that given by the scratch of a pin or by a mild faradic current) is moved across the skin, the subject states that it feels stronger or weaker at certain points. These points, when carefully mapped out, are found to lie on lines which correspond to the boundaries of the segmental or radicular areas of distribution of the afferent nerve fibres. In this case the phenomenon was very well marked in the upper limbs—so that nearly all the boundary lines could be traced, even on the hand, which is relatively blunted in this condition as a rule. 'Heteræsthesia' was not well marked above the fifth cervical segment, although there was a somewhat vague indication of the outline of the fourth cervical area. It was, however, clear on the thorax, abdomen, and lower limbs. The phenomenon was tested by two independent and rather sceptical observers, who found the lines of change to correspond very nearly with those mapped by the writer.

The abdominal reflexes were present; the cremasterics were brisk; the plantar responses were brisk flexion; and all these responses were equal on the two sides of the body. The supinator jerks and the biceps jerks were absent in the upper limbs. The triceps jerks were present and equal on the two sides. The knee-jerks were equal on the two sides, and they were brisk. So, too, were the ankle-jerks. There was slight ankle-clonus.

Motor power was defective in the upper limbs. In the right, slight movement was present at all joints. There was great paresis, but no absolute paralysis. In the left upper limb the paresis was less than in the right, but it was well marked. The left hand-grip was stronger than the right. Patient was able with difficulty to raise his right hand to his face, and could raise his left hand much more easily. Motor power was apparently normal in the lower limbs.

There was marked inco-ordination in the movements of the upper limbs. So much was this the case that he could not feed himself. In the 'finger-nose' test his movements were wildly inco-ordinate. He stabbed his finger all over his face, and even, in the case of his right hand, missed his face altogether. This inco-ordination was present when he did the test with open eyes. It was most marked on the right side.

When lumbar puncture was performed, the cerebrospinal fluid was found to be under marked pressure. There was no increase in the globulin content, and a cell count showed six cells per c.mm.

The bruises were treated in the ordinary manner, and he was made to feed himself, at first with help, later without it. Improvement was rapid.

Progress.—One week later, on April 15, the 'heteræsthesia' was still marked in both upper limbs as high as the fourth cervical root area. It was now slightly marked on the abdomen, and absent in the lower limbs. There was marked hyperæsthesia of both upper limbs in the fourth or fifth cervical to fourth thoracic dorsal root areas. He complained of numbness in these areas, but there was no kinæsthetic disturbance.

In the right upper limb the reflexes were as before, but in the left the biceps jerk was present and a slight supinator jerk could be obtained. The motor power of the left upper limb was now apparently normal. In the case of the right upper limb the hand-grasp was weak, but movement was weaker at the shoulder than elsewhere. The movements of the wrist and fingers were weak, and flexion of the elbow was weak, although extension was fairly strong. The movements of the left upper limb, and both lower limbs, now showed no inco-ordination; but there was still a certain amount of inco-ordination in the movements of the right upper limbs, for

instance in the 'finger-nose' test. This inco-ordination was, however, much less than before. There was much stiffness in the right shoulder, and pain when it was moved. Massage was now commenced.

The steady improvement was maintained, and a fortnight later, on April 29, the movements of the right upper limb were much greater in extent and strength. Six days later he complained of the numb feeling in the right upper limb only. This was now confined to the areas of distribution of the seventh cervical to third dorsal root areas. There were hyperæsthesia and hyperalgesia in these areas, also now on the right side only. There was no sensory loss of any sort. 'Heteræsthesia' was present in the right upper limb, less well defined in left, and absent elsewhere. Motor power was now good. All individual movements of the right upper limb could be performed fairly well. He could deal a pack of cards with his right hand. His right hand-grasp was still weaker than his left. There was little, if any, inco-ordination in the movements of the right upper limb. Pointing tests were done fairly accurately with either hand. There was a fine tremor of his outstretched fingers. His gait, which had been rather uncertain fourteen days before, was now normal. No Rombergism was noted.

On May 12 he was evacuated, the movements of the right upper limb having still further improved in strength.

**Remarks.**—This case may with confidence be described as one of concussion of the lower cervical and upper thoracic spinal cord, brought about by the direct hit (or graze) of a live shell. It is of interest as an instance of a very narrow escape indeed: and it is well-nigh impossible to conceive that any man could have been in actual contact with a shell in its flight and yet escape, not only with his life, but with such comparatively slight injuries, and actually with an unbroken skin. Perhaps other similar cases have been reported, but no parallel instance has met my eye.

But there is also a more scientific interest in the association of the phenomenon of 'heteræsthesia' with concussion of the spinal cord. It has already been stated above that this phenomenon has previously been observed in cases of general concussion of the nervous system (shell concussion), of cerebral concussion (with fracture of the base of the skull), and of partial compression of the spinal cord.

In the first two of these three classes there may be no other sensory disturbance. In the last the analogous phenomenon occurred below the level of injury of the cord, and only upon one side of the body. It is not difficult to frame an hypothesis which will cover these different cases. The state of 'excitability' of different parts of

the nervous system is known to vary under different conditions. The primitive segments of the spinal cord may be considered, in a sense, as different individual parts of the nervous system. Complex co-ordinated acts which involve many different spinal segments might be rendered inefficient if the states of 'excitability' of these different spinal segments varied more or less fortuitously amongst themselves. As this inefficiency does not normally occur, it may be argued that a function of the co-ordinating mechanisms which integrate the different parts of the nervous system is the control of states of excitability, so that different segments are kept properly in tune. As the great co-ordinating mechanisms have their chief centres towards the head end of the animal, these co-ordinating paths—whether propriospinal or passing from cerebral or mid-brain centres to other parts of the nervous system—are most probably descending. A concussion may for a time throw this mechanism out of gear, or a lesion (as in partial compression of the spinal cord) may interrupt the descending tracts. In either condition the lower segments may pass out of control (or out of full control) of the co-ordinating centre, and may assume different states of 'excitability' more or less independently. In these circumstances the values of equal stimuli may be different when the in-going nerve-impulses which they engender impinge upon different segments. Hence the phenomenon of 'heteræsthesia'.

The case described above is of further interest inasmuch as the 'heteræsthesia' was at first widespread below the parts primarily affected, as if the long descending paths (on our hypothesis) had been affected. Later on, this widespread distribution disappeared and the phenomenon was confined to a comparatively small number of spinal segments. It looks as if the condition was then due to more or less local factors, and not to a concussion of the chief centres\*: in other words, that it was due to a local disturbance of the spinal segments in the lower cervical and upper thoracic regions. This disturbance may have been a disturbance of the central nerve endings, in this region, of the descending paths from the chief centres, or of the mechanisms upon which these paths acted, or of the shorter propriospinal paths.

It may perhaps be inferred that the phenomenon of 'heteræsthesia' may result not only from a concussion of the higher centres, or an interruption of their descending paths, but also from a local concussion or disturbance of the mechanisms in the spinal cord itself.

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\* The breathlessness and the difficulty in closing his mouth which the patient experienced immediately after the blow of the shell both point to a concussion of nerve centres higher than those in the cervical spinal cord.



## Critical Review.

### VAGOTONIA.

BY ALFRED CARVER, BIRMINGHAM.

EVER since Beard's work on 'neurasthenia', neurologists have been endeavouring to separate out from the motley mass of nervous disorders which carelessly are included under this all-embracing term, various symptom-complexes each having a definite etiology, and to which therefore a more rational therapy might be applied. Janet first rescued psychasthenia from this diagnostic waste-paper basket, and later observations have already succeeded in further subdividing it. Freud also insisted upon the propriety of separating from neurasthenia a definite symptom-complex, to which he gave the name 'Angstneurose'. More recently Eppinger and Hess have attempted to separate out another definite neurosis, the manifestations of which they ascribe to increased activity, either absolute or relative, of the parasympathetic or extended-vagus system. This they have described under the caption of vagotonia. They consider it is a constitutional condition correlated to abnormalities of the endocrine and sympathetic system.

Before proceeding to a more detailed examination of this hypothesis, it will be well to call to mind briefly our knowledge concerning the vegetative or involuntary nervous system. This knowledge, mainly the result of researches by the Cambridge school of physiologists, is based upon anatomical, physiological, and pharmacological evidence. Anatomically and histologically the vegetative system cannot readily be distinguished from the sensorimotor system. Centrally their nuclei lie close to one another and are intimately connected by anastomoses. The principal difference lies in their peripheral make-up.

In the words of Gaskell, "The involuntary nervous system is built up on the same plan as the voluntary, with receptor, connector, and excitor elements. The marked difference is that the excitor elements have left the central nervous system and become peripheral, forming various ganglia throughout the body". Langley, for topographical reasons, divides these into ganglia of the first, second, and third order, and has shown experimentally that nicotine, which does

not affect the psychomotor nerves, blocks the passages of impulses through these ganglionic stations. The receptor elements of the involuntary system are in the same position—posterior root ganglia—as those of the psychomotor system, and, though functionally distinct, cannot histologically be differentiated from the latter. The anatomical difference in arrangement in the two systems corresponds to a difference in function. The sensorimotor system is designed for accurate local reflexes, while the involuntary system is adapted to produce widespread and diffuse effects. The vegetative system itself is divisible into two main groups: (1) The sympathetic proper, making central connections from the first dorsal to the third lumbar segment of the cord, and distally forming the sympathetic cord; (2) The parasympathetic system, connecting with the midbrain, medulla, and sacral region, but not coming into relation with the sympathetic cord. All vegetative organs are supplied by nerves from both of these groups. Anatomically the nerves of supply from the two groups are commingled, so that we must rely upon physiological and pharmacological means for their differentiation. So far as physiological differentiation is possible, investigation by electrical stimulation shows that in many organs the effects produced by stimulating the fibres of one group are opposed to those produced by stimulation of the others. Sherrington's law of reciprocal innervation of antagonistic muscles certainly applies to the involuntary system, as was originally demonstrated by Gaskell. In this sense the two groups may be considered as antagonistic in their action. Eppinger and Hess, however, assume an absolute antagonism between the two systems, and disregard all other evidence in favour of pharmacological results. This, as we shall see later, introduces certain inconsistencies and can only be accepted with reserve. It is generally conceded that adrenin acts solely upon the sympathetic system, and that its action is identical with stimulation of the sympathetic. No similar substance has been isolated from the body in connection with the parasympathetic system; but Eppinger and Hess postulate the existence of a hypothetical hormone (to which they give the name *autonomin*) having the same relation to the parasympathetic or extended-vagus as has adrenin to the sympathetic system. Although no such substance has been discovered, we possess in certain drugs such as pilocarpine, physostigmine, and muscarine a substitute for it. Generally speaking, these drugs produce effects experimentally similar to those obtained by stimulation of the extended-vagus system. Yet here we meet with one of the difficulties previously referred to: for these drugs stimulate also the sweat glands, which upon anatomical and physiological grounds would appear to be innervated by the sympathetic. Eppinger and Hess, however, prefer to rely on pharmacological tests.

and point out that adrenin abolishes the secretion of the sweat glands. In further justification of their attitude they quote the work of Frölich and Loewi, and of Biedl, which points to a general antagonism between the two parts of the vegetative system. This work also shows that, while adrenin apparently acts equally on all sympathetically innervated organs, drugs taking the place of their hypothetical autonomin have a markedly selective action upon different branches of the 'vagal' system. Thus, for example, pilocarpine acts particularly upon secretory fibres and but slightly upon the heart. The acceptance of the pharmacological test as supreme also introduces difficulty in the matter of the vasodilator fibres and some other minor points, but on the whole the several functions of the systems as determined by this method correspond to those obtained by the physiological.

With regard to the fundamental hypothesis of 'tone' in the autonomic system, we know that the output of adrenin into the blood is constantly maintained, and exercises a tonic influence upon sympathetically innervated organs. Now Eppinger and Hess argue that although there is no proof of the existence of a specific analogue to adrenin, yet certain physiological and pathological evidence is conclusively in favour of the presence of vagus tone. The increase of cardiac action after paralysis or section of the vagus, together with much similar evidence, goes to support this hypothesis. They agree that tonus and irritability are not identical—thus physostigmine increases only the irritability of the vagus, while muscarine raises the tonus—but they draw no clear distinction between these two states. The hall-mark of the 'vagotonic' is that he shows manifestations attributable to a functionally high tone and increased irritability of the whole 'system of the extended vagus'. Eppinger and Hess go further, however, in postulating that the vagotonic has as an associated condition a decreased sensitiveness to sympathetic stimuli. They state explicitly that "increase of tonus in one system almost rules out an increase of tonus in the other". Later, we shall meet with inconvenient exceptions to this postulate. They find that, in general, individuals who show a great sensitiveness to adrenin are relatively tolerant of pilocarpine, and vice versa; hence "there must be a pharmacodynamic antagonism". It is with regard to the acceptance of this postulate of strict antagonism between the two systems that most reserve is called for. Not only are there individuals who show a high degree of sensitiveness to both classes of drugs—sympathicotropic or vagotropic—but the two systems may be thrown into activity together both in health and disease. Thus, physiological secretion of saliva is brought about by activity of the two systems, sympathetic stimulation producing a viscid secretion, parasympathetic stimulation a fluid one. From the pathological side, an increased activity of the

whole vegetative system is exemplified by most cases of exophthalmic goitre.

Clinically the picture of the vagotonic is as follows:—Typically the patient is young or below middle age. His appearance is that of a 'nervous invalid'. His skin is blotchy, changes rapidly from a flushed to a pale coloration, sweats readily, and has a greasy look. His extremities are cold, clammy, and cyanotic. He is under-nourished, but shows hyperplasia of the adenoid tissues. His lips are thick, his tongue is large and fissured, his palate is narrow and high-arched. He is constantly swallowing, because his salivary secretion is excessive. His respiration is shallow and irregular. These characteristics produce in the aggregate rather a curious picture, and one is not surprised that Eppinger and Hess can sometimes recognize a vagotonic as he enters the room. In spite of all the discomfort, not to say disability, which the above list of peculiarities might seem to imply, the patient's complaint is of something which does not appear to be connected with any of them. Most commonly the complaint is "a feeling as if the heart might suddenly stop". Another common complaint is a feeling of distention in the stomach soon after beginning a meal. Excessive sweating and a number of trivial neurotic symptoms may also be troublesome. Although the patient does not draw attention to many of the vagotonic signs present, these are easily disclosed by careful questioning and examination. They are all explainable in terms of increased activity of the parasympathetic; they are intensified by the diagnostic employment of pilocarpine, and relieved by the administration of atropine.

Occasionally one meets with patients who make complaint of more frankly vagotonic symptoms such as asthma. On the other hand, the experimental injection of pilocarpine may disclose, in apparently normal individuals, a latent hypersensitiveness of the 'vagal' system. When the history of such individuals is carefully gone into, one generally discovers that in childhood they suffered from convulsions, laryngismus stridulus, nocturnal enuresis, spastic constipation, or enlarged tonsils and adenoids.

All vagotonic symptoms being intensified by the administration of vagotropic drugs such as pilocarpine, it is only reasonable to expect that they will be diminished or cured by atropine. This expectation frequently is realized, and herein, even if for no other reason, the clinical recognition of vagotonia is justified. Eppinger and Hess urge that "the harmlessness of atropine demands that it be used more extensively", . . . especially "if, combined with those various obscure and troublesome complaints which, due to lack of anatomical basis, are called 'nervous', a patient is found with signs of a vagotonic constitution". If the postulate that vagotonia is associated with



sympathetic inhibition be remembered, we may also seek to combat the conditions by raising the tonus of the sympathetic system. This we achieve in certain cases, e.g., spasmodic asthma, by the administration of adrenin. Thus, whatever may be urged against the underlying hypotheses, their cautious provisional recognition is of value in clinical medicine. We cannot help noting, however, that in all the efforts to separate out from 'neurasthenia' symptom-complexes which depend upon actual neurosis, the psychic factor is not sufficiently taken into consideration. Even Freud, in his paper upon 'Angst-neurose' in 1895, described the "bestimmtem Symptomen-komplex" as an actual neurosis originating from physical tension, and having no psychogenesis. This idea has subsequently been modified, and though the concept remains a valuable one, it is now generally recognized that even where physical factors appear to be primary, psychic ones which cannot be neglected come into play. It is the overlooking of this fact which constitutes the most disappointing feature in the work of Eppinger and Hess, particularly that part which treats of vagotonia as a definite neurosis. True, when at a loss to account for certain phenomena inconvenient to their hypothesis, they are led to dismiss them as due to an associated psychosis, but they pursue this promising idea no further. So convinced do they feel that "the real etiology of vagotonia must be sought in some disturbance of internal secretion", that they entirely lose sight of the influence of the mind upon all secretion, though the researches of Pawlow and of Cannon, which are pertinent to their theme, should have saved them from this oversight.

So far we have been dealing with vagotonia as a definite neurosis: but Eppinger and Hess, in seeking to apply their hypotheses to the elucidation of other morbid conditions, wander over the whole field of medicine. They endeavour to explain in terms of the vegetative constitution those variations in symptomatology which are met with in other diseases. The picture of a pathological process receives, according to this view, its colouring from the type of vegetative activity predominant in the individual. Could this be successfully maintained, a great many of those characteristics of a particular course of a disease which at present are dismissed as dependent upon idiosyncrasy would receive a more scientific and practically valuable explanation, as due to a lack or excess of a definite nervous disposition of the organism.

We cannot follow Eppinger and Hess through the wide discursions which, in working out this idea, they permit themselves. But let us take *tabes dorsalis* as an example. How is it that in some tabeties visceral crises are so prominent, in others entirely lacking, while in yet a third group there is visceral analgesia? "It is not difficult to



show", state Eppinger and Hess, "that the crises themselves are signs of vagal irritation". The narrowing of the pupil at the onset of the attack, the subsequent gastric hypersecretion, the increased peristalsis and sweating, together with other phenomena, all point to this etiology. The entire absence of crises, then, is attributable to the presence of an underlying sympathicotonic disposition. Visceral analgesia, so complete as to mask severe abdominal lesions such as a perforated gastric ulcer, is to be accounted for by the assumption that paralysis and degeneration of the parasympathetic nerves have succeeded a state of irritation. Thus the variation of this symptom in tabes is due to a specific action of the toxic agent upon the parasympathetic system; and crises are prominent or absent according to the functional condition of the system. The attempt to apply these principles to Graves' disease gives rise to considerable difficulty, symptoms referable to increased activity of each part of the vegetative system being simultaneously present. Eppinger and Hess endeavour to overcome this difficulty by recognizing three types of the disease: (1) A pure vagotonic type, the symptomatology of which is explicable by assuming that hyperthyroidism is exerting its influence upon a vagotonic constitution. (2) A pure sympathicotonic type brought about by hyperthyroidism in a constitutionally sympathicotonic individual. Both these types, they admit, are rare. (3) Should the individual have been neither vagotonic nor sympathicotonic before the onset of the disease, the thyroid secretion, since it affects both systems, will cause symptoms of irritation to both. Eppinger and Hess seek to dispose of this admittedly weak point in their argument by acknowledging that during psychic disturbances over-activity of both parts of the vegetative nervous system may be demonstrated, and they therefore consider it legitimate to allow the same powers to disturbance of the thyroid.

Here, however, we find ourselves in no-man's-land, and are reminded of the close association between Graves' disease and 'anxiety neurosis' to which reference has already been made. Stoddart affirms that the two conditions differ by only one, or at most two, symptoms, and that both conditions are curable by psycho-analysis. Crile asserts that he has never known a case of Graves' disease which was determined by physical factors unattended by psychic strain. It is precisely in this borderline region that the intimate interconnection between the vegetative, the sensorimotor, and the psychic levels of nervous systems is most insistently forced upon our attention. Thus a disturbance at the psychic level may show its effects not only at this level as psychasthenic phenomena, but may descend to the sensorimotor level as a conversion-hysteria, or to the vegetative level as diabetes, Graves' disease, or spasmodic asthma. At the vegetative

level the outlet may be either on the sympathetic or parasympathetic arm of the balance of chemical integration. Now Eppinger and Hess seem to say that, according as the symptom is on the one or the other arm of the vegetative system, the individual has a sympathicotonic or a vagotonic disposition. Actually, however, they do not suggest this, for they have approached their problem too much from the opposite aspect, and have tended to regard their patients merely as test-tubes in which certain pharmacological reactions may be observed.

Hitherto, psychological explanations of the neurosis have been, from the therapeutic point of view, the more helpful. But we may look forward to a time when, as a result of further advances in endocrinology and the study of vegetative neurology, the underlying physical factors in the psychoneurosis will be more clearly understood and therefore more vulnerable to our therapy. The attempt of Eppinger and Hess to throw light upon that obscure but enormously important factor which we call 'constitutional disposition' marks another, and it seems to us a suggestive and valuable, step in this direction.

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## Editorial.

### THE REALM OF NEUROLOGY.

SOME day, perhaps, it might be worth while collecting evidence as to the formative and determining factors that lead a man to adopt one or other of the medical specialties. Son succeeds father in not few instances, so potent are the influences moulding the trend of youthful energies and desires: but in many other cases the medical student is the sole representative of the profession in his family, and ploughs his furrow alone. How comes it, then, that in the course of time he turns with avidity to otology, gynæcology, ophthalmology, or whatever it be that fascinates him? Even the general practitioner has preferences and inclinations for one or other department of medicine, and before he has qualified he has often already decided what line to pursue. Occasionally, on the other hand, a policy of mere drift, or the fortuitous combination of circumstances, leads to fixation in medical work. The universal specialist, the amateur of all the specialties, is as rare, in truth, as is the practitioner who exhibits neither preferences nor dislikes, and, with the sum of scientific and clinical knowledge ever augmenting, such survivals of a simpler era are foredoomed to disappear. In not a few country towns and districts practitioners have formed 'teams,' individual members of which have the chance of concentrating on that branch of medicine in which they find the best opportunity of self-expression.

Concurrently with this general trend towards specialism there exists a more subtle movement in the direction of the re-division or re-grouping of the constituent elements of the specialties. Neurology signifies the science of the nervous system, and by tacit consent the neurologist is he who handles nervous disease in any and all of its manifestations. Fifty years ago his faculties were perhaps devoted with greater relish to the simple correlation of ante-mortem diagnoses and post-mortem findings than a progressive twentieth century is likely to tolerate: but the tendency remains, nor is it worthy only of condemnation. A large area of the cerebral cortex is still unexplored: who shall say what is the function of the under surface of the frontal or temporal lobes, and how better shall the problem be solved than by the clinico-pathological method? None the less, cure or, even better, prevention, is demanded of the neurologist, and it

provides food for thought that his realm is steadily being encroached on, and therapeutic results therein obtained, by workers whose activities are overflowing from other departments of medicine, and who are in search of fresh worlds to conquer. The endocrinologist would appropriate the pituitary body to himself, if he could, studying its secretory phenomena with as much justification as he does those of the pancreas; but the ophthalmologist claims a *locus standi* with equal persuasiveness, since but a trifling millimetre or two separate the hypophysis from the chiasma, while the oto-rhino-laryngologist quietly pushes his operative range a little further and refuses to have it limited by the roof of the nasopharynx. Where does the neurologist come in? The cynical suggestion is rather that he goes out. Epidemic cerebro-spinal meningitis, a nervous disease *par excellence*, is diagnosed and treated with success by the bacteriologist, and the syphilologist would oust the mere nerve specialist from the trail of the spirochæte, though it lead to the heart of the neuraxis. Neurasthenia—blessed word—still remains, it may be, for the neurologist, or would remain, were we not assured by the endocrinologist that it is a disease of the ductless glands, by the alienist that it is a form of mental disorder, by the cardiologist that it is a functional cardiac disturbance, and by the Freudian that it is a sort of nosological Mrs. Harris.

Whither shall the nerve expert turn? Five years of war have led the psychotherapist or practising psychologist to give him a gentle hint that functional nervous disease is not for him; by way of consolation he can interest himself in chronic nervous degenerations, or classify myopathies and cerebellar aplasias to his heart's content. Let him beware, however, of the embryologist, the eugenicist, and the biometrician, who are hard on his heels.

The truth is, in reality, that the neurologist of to-day is he who pursues the study of either psychical or physical side, or both, and who has succeeded to an empire wherein is stored the accumulated wealth of knowledge derived and being derived from scientific and clinical research on the part of many differing groups and fellowships of workers. The nervous system still stands as the very core, the hub, of ever-widening theoretical and practical interests. More than ever must the neurologist be a man of culture and of aspiration, a savant in the right sense of the word, who can see his subject whole, and appreciate contributions from whomsoever they come. He boldly takes its vegetative, sensorimotor, and psychical aspects alike for his province, and will not relinquish any section of the field to deputies. On the contrary, he asks and expects of those who have approached its precincts from without that they too should take the large view, and, while he acclaims the advance in therapy consequent on their efforts, and welcomes collaboration, he would have them

remember that with special and local knowledge comes the responsibility of basing it on the secure foundation of the essential unity of neural function. The neurotic tachycardia that intrigues the cardiologist may be one only of the constituents of a nervous syndrome; the acute visceral symptoms for which the surgeon performs a laparotomy may be explained by the detection of Argyll Robertson pupils and the absence of the knee-jerks. Nor is the neurologist's task less onerous; what if he misinterprets and treats as hysterical the rapid heart's action of auricular fibrillation, or fails to discover the neoplastic basis for the symptoms of his gastric neuropath?

We must aim at harmony in medical diversity, and cultivate consultative intercourse. It is our hope and belief that if in all that pertains to the nervous system interchange of opinion and knowledge from differing standpoints is freely prosecuted, the mental horizon both of the neurologist and of those other workers, practitioners and specialists, whose circles of activity impinge so definitely on his own, will be materially widened, to the enduring advantage alike of physician and of patient.

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## THE PRESENT POSITION OF PSYCHOPATHOLOGY.

PSYCHOPATHOLOGY is a science of comparatively recent growth. So long as psychology was dominated by sterile academic conceptions, no fruitful application to the problems of practical medicine was possible, and such an application had to await the advent of a psychology in touch with the actual realities of life. In the last half-century a psychology of this type has developed, largely owing to the work of medical men whose main concern has been with the facts of mental disorder, and who found it necessary to construct principles which would serve to explain those facts. As a result of these labours a body of knowledge has now arisen to which the name of science may reasonably be applied.

Psychopathology has not yet achieved, however, a solid foundation of universally accepted principles. There is much divergence of opinion, not only as to method and technique, but even as to fundamental postulates; and in endeavouring to form any adequate estimate of the present position of psychopathology, many different schools of thought have to be reckoned with.

First amongst these schools must be placed that of Freud: not because of the number of its adherents—for those who accept Freud's



teaching in its entirety are still few—but because Freud's fundamental conceptions have altered the whole trend of modern psychology and psychopathology, and it is easy to trace their influence in the writings even of men who express an uncompromising opposition to Freud's methods and practice. Next may be mentioned the schools of Jung and Adler, former followers of Freud who have now diverged materially from his standpoint. Then there are the various exponents of suggestion in one or other of its forms, the advocates of persuasion, a school which has found its chief expression in the works of Dejerine and Dubois, the school of Janet, and many others who combine in a greater or less degree the tenets of several of these authorities.

To the practitioner who has not the time and opportunity to investigate the similarities and differences existing between the various schools, the mass of conflicting opinions is naturally bewildering. Yet there is much common ground, although unfortunately it is often obscured by the uncompromising methods of exposition adopted by many writers. In this common ground the most fundamental principle is the recognition that psychological causes may produce disorder, and that in the rectification of such disorder psychological methods of treatment—the methods of psychotherapy—must necessarily be employed. The precise method advocated depends naturally upon the view taken of the psychopathology of the disorder; but here again the divergences are not so great nor so fundamental as may at first sight appear. There is, however, a great need for co-ordination in the work of the different schools, so that the common ground may be clearly marked out and the divergences accurately defined. A further need is for co-ordination between the findings of psychopathology and the facts which have been elicited by other branches of medicine, notably neurology and endocrinology.

The dispute which has long raged as to whether mental and so-called 'functional nervous' disorders are of psychical or physical origin—a dispute which is inevitably sterile—should be replaced by a careful taking into account of the material which every method of approach—chemical, physiological, anatomical, psychological—is able to offer, and an attempt to correlate this material into an harmonious whole.

Perhaps the conception which promises the most fruitful line of advance in this direction is that of biological reaction, the view that the field of mental and 'nervous' disorders is one in which disease entities in the strict sense of the word cannot profitably be distinguished, but that the clinical pictures encountered are to be regarded as different types of reaction in a psychophysical organism to the environment in which it has to live. In the development of such a

conception it may be hoped that all the facts ascertained, whether they be chemical, anatomical, physiological, or psychological, will fall into place and be capable of correlation one with another.

One of the chief objects of the JOURNAL is to help in this co-ordination and correlation. It is not identified with the views of any particular school, and will be ready to receive contributions from every source. An attempt will be made, moreover, by means of abstracts and critical digests, to present a review of the work which is being carried out by each of the various schools. In these ways it is hoped that the linking together of the different lines of attack will be facilitated, and that it will be found possible to attain to that comprehensive and catholic view which we feel to be indispensable for progress.

## Abstracts.

### Neurology.

#### NEURO-ANATOMY AND NEUROPHYSIOLOGY.

- [1] On the centres for smell and taste (Ueber die Geruchs- und Geschmackszentren).—S. E. HENSCHEN. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 121.

THE author describes 18 cases, which, he says, seem to be the only ones published, of sharply defined lesions in the region of the smell centres, with clinical observations.

He concludes a comprehensive review of the literature—anatomical, experimental, and clinical—by agreeing with Campbell and Brodmann that the evidence, while in favour of the localization of the olfactory sense in the region of the gyrus hippocampi, admits no conclusions as to the exact position of the centre: in reference to the taste centre, information is still more meagre.

A critical analysis of the new cases follows, with details of the clinical and pathological findings in lesions of the uncus, gyrus hippocampi, and cornu Ammonis, affected singly and in various combinations, with the following general conclusions:—

If the uncus is intact, then, in spite of other lesions in the neighbourhood, no lasting disturbance of smell occurs. If the uncus is affected, disturbances arise, which, however, disappear in the course of time.

Destruction of one hippocampal gyrus causes no disturbance of smell, at least under the conditions of the present inquiry—that is, if a certain time has elapsed since the onset of the lesion (five days to seventeen years in the cases described).

A unilateral lesion of the cornu Ammonis alone, or with the hippocampal gyrus, is not necessarily followed by disturbance of smell. Even with unilateral destruction of the uncus, hippocampal gyrus, and cornu Ammonis, smell may be unaffected (one case). All these facts force the author to what seems to him the only conclusion, viz., that the smell centres are so completely innervated bilaterally that unilateral lesions reveal themselves only exceptionally by disturbances of smell; in man, other parts take over the lost function promptly, and neutralize the effects of the lesion.

The idea of a higher psychical olfactory centre, placed by Bechterew and Cajal in the hippocampal gyrus or cornu Ammonis, is discussed, but receives no conclusive support; nor does the evidence point to any difference in the importance of the left or right side of the brain. The only

conclusion about the taste centre is negative, i.e., that neither the gyrus hippocampi nor the cornu Ammonis subserves this sense.

A plate shows the site of the lesion in each case.

W. J. ADIE.

- [2] The influence of the nervous system on glycæmia and glycosuria.  
—J. MELLANBY. *Jour. of Physiol.*, 1919, liii, 1.

THE author finds that the urine of anesthetized animals contains dextrose. This glycosuria is associated with hyperglycæmia. The factors responsible for this are (1) the anæsthetic, and (2) afferent nerve stimulation, the latter being much the more potent. In a decerebrate animal there is a continued glycosuria: but in a spinal animal the glycosuria is transient, and, when it has disappeared, afferent nerve stimulation no longer reproduces it. This difference between the decerebrate and the spinal animal is not due to difference in blood-pressure. The author suggests the presence of a "glycæmic centre" which is situated "between the cerebrum and the cord". He supposes that it is discharged by impulses passing from any afferent nerve, and inhibited by impulses from the cerebrum.

T. G. B.

- [3] The response of human sensory nerves to currents of short duration.—E. D. ADRIAN. *Jour. of Physiol.*, 1919, liii, 70.

THERE is a definite relation between the strength of current required to excite an excitable tissue and the length of time for which it must be applied. The time factor of a strength-duration curve is approximately constant for a given tissue, but varies widely from one tissue to another. The author uses this test to examine the question whether there is more than one excitable mechanism in the afferent nerves of man. According to the theory of Head and Rivers this might be the case, for they have supposed that there are two distinct systems of afferent nerves—the epieritic and the protopathic. Ranson suggested that the latter nerves are non-medullated. The curves obtained in the present experiments, however, show no indication of two different excitable systems in human afferent nerve. This result does not, of course, negative the possibility that two such systems do actually exist.

T. G. B.

- [4] Vasomotor centres. Part I: Effect of strychnine on the blood-pressure in the spinal animal.—J. N. LANGLEY. *Jour. of Physiol.*, 1919, liii, 120.

IN this first paper of a series Langley shows that a large rise of blood-pressure is caused by a small amount of strychnine in the spinal cat (decerebrate curarized preparation with division of the spinal cord in the mid-cervical region). Thus the support given to the theory that all vascular reflexes are bulbar by the supposed slight or absent action of strychnine on the spinal cord, falls to the ground. Strychnine causes a quick and large rise of blood-pressure in the decapitate cat after excision of the suprarenal glands; but the question of the part taken by adrenalin in the strychnine rise was not further examined. From the experiments it is

inferred that strychnine stimulates some central nerve cells; that the degree of stimulation depends upon the *rate* at which strychnine is taken up: and that when successive small amounts are given, it is gradually taken up nearly to saturation point. The centres causing muscular movement and those causing rise of blood-pressure are not connected in the spinal cord.

T. G. B.

- [5] **Vasomotor centres. Part II: Observations on the action of strychnine.**—J. N. LANGLEY. *Jour. of Physiol.*, 1919, liii, 147.

IN this paper Langley finds that the effect of strychnine on the bulbo-spinal animal closely resembles that on the spinal animal. The maximum rise of blood-pressure is caused by a small amount of it. Additional amounts give slight and decreasing rises. Later injections give primary fall and partial recovery of blood-pressure. Strychnine causes an apparently maximal rise of blood-pressure after excision of the suprarenal glands. It causes some rise after removal of the abdominal viscera. Its effect upon the cutaneous vessels is therefore probably one of constriction—as it is on the visceral vessels. Strychnine does not convert vaso-inhibitory into vasoconstrictor impulses. In anæsthetized animals, strychnine, after causing a primary fall, may cause a slow rise of blood-pressure above the original height—suggesting stimulation of centres above the level of the spinal bulb.

T. G. B.

- [6] **Neuroglia and non-myelinated fibres in nerves.**—WINIFRED PARSONS. *Jour. of Physiol.*, 1919, liii, 135.

RANSON found groups of small fibres in the posterior roots of the spina nerves. These stained deep black when treated by a modified silver-impregnation method. Their chief interest lies in the guess that they are nerves and subserve a particular function of centripetal conduction. Parsons shows, however, that they are inconstant in number in different nerves and in different parts of the same nerve: that they occur also in the anterior roots: and that they are smaller in the rat than in the cat, while a similar difference in size occurs in the neuroglia fibres of these two animals. He concludes that they are really neuroglia fibres, and not afferent-nerve fibres at all.

T. G. B.

- [7] **The time relations of the blood-pressure changes after excision of the adrenal glands, with some observations on blood-volume changes.**—H. C. BAZETT. *Jour. of Physiol.*, 1920, liii, 320.

THE author finds no immediate fall in blood-pressure after excision of the adrenal glands in cats. Blood-pressure changes develop later on—more quickly in decerebrate cats than in cats anæsthetized with urethane: still less quickly in cats anæsthetized with ether and allowed to recover. Excision of the adrenals in decerebrate cats leads to death in 6 hours; in urethaned cats, to death in about  $10\frac{1}{2}$  hours: in ether-anæsthetized cats (allowed to recover), in 18 to 24 hours.

T. G. B.



## NEUROPATHOLOGY.

- [8] **Contribution to the study of the pathogenesis of tabes** (Contribution à l'étude de la pathogénie du tabes).—GALLOTTI and AZEVEDO. *Revue neurol.*, 1919, xxvi, 489.

This paper contains a summary of Spielmeyer's researches, to which the authors have added by their own observations.

Spielmeyer, being struck with the resemblance, both clinical and pathological, between the affections of the central nervous system in trypanosomiasis on the one hand and tabes and general paralysis on the other, proceeded in 1906 to inoculate trypanosomes into the subarachnoid space in dogs. Working with a special strain of *Tryp. brucei*, he obtained evidence of degeneration in the fibres of the dorsal spinal roots, the optic nerve, and the sensory root of the 5th cranial, in 18 out of 42 dogs examined. Clinically the animals showed no signs of nervous disease save for a diminution of the tendon-jerks in the fore limbs. Marchi's method of staining showed a selective incidence of degeneration upon the fibres of the dorsal roots at their entrance into the cord, the earliest lesions being found at the point at which these fibres pass through the pia mater—the Redlich-Obersteiner zone. This constitutes a close resemblance between the experimental lesions and those of tabes dorsalis. The affection of the sensory root of the 5th, and of the optic nerve, strengthens this resemblance. No changes were found in the ganglia or peripheral nerves. The authors' own experiments were performed upon three puppies with *Tryp. cruzi*. The animals were trephined under a general anæsthetic, and a small quantity of the blood of a guinea-pig in which the presence of the trypanosome was verified was injected subdurally into each. One dog only, a new-born puppy, survived the operation, and examination of its blood twenty-five days later revealed the presence of trypanosomes. Clinically it appeared thin and weak. It was killed at the end of three months, when examination of the nervous tissues by Marchi's method showed degeneration of the dorsal root fibres between the ganglia and the cord. By this method the cord itself appeared normal, but in Weigert-stained preparations there were visible in the lumbar region scattered pale areas showing an absence of myelinated fibres, and in the cervical and thoracic regions similar patches confined to the anterolateral columns and the dorsal root zones.

Microphotographs are reproduced in illustration.

C. P. SYMONDS.

- [9] **The pathogenesis of tabes dorsalis**.—W. F. SCHALLER. *Arch. of Neurol. and Psychiat.*, 1919, i, 749.

In this contribution, which is based on a study of the cord and meninges in sixteen cases of tabes, the author adheres to the old meningeal theory. He considers that both the cranial-nerve involvement and the dorsal-root degeneration are conditioned by subacute syphilitic inflammatory changes in the subarachnoid space, and that these changes may act in one of several ways: (1) Mechanical: (a) by fibrous constriction of the dorsal roots in their perforation of the spinal pia at Obersteiner's area: (b) by root

pressure from increased cerebrospinal fluid pressure in this same locality. (2) Inflammatory: by direct extension of meningeal inflammation causing a meningo-radculitis as in Nageotte's area. (3) Toxic: by toxic products engendered by the meningeal inflammation in the subarachnoid space affecting the dorsal roots.

In fourteen cases in his series there was evidence of inflammatory changes in the cord membranes, and he concludes that the primary change in *tabes dorsalis* is therefore a meningitis affecting the pia-arachnoid. As additional evidence in support of his contention, Schaller assumes that the cerebrospinal fluid reactions in this disease are due to the presence of a subacute syphilitic meningitis.

The meningeal theory of *tabes* is open to several objections. Even if it be granted that the morbid changes in the membranes are of the nature of a true inflammation rather than a secondary thickening, there does not appear to be any constant relationship between the degree of pial inflammation and the extent of cord degeneration. It has been frequently noted by other observers that in the early stages of *tabes* the intramedullary degeneration is often well marked when the dorsal roots and membranes exhibit no appreciable change. Nor is it easy to see why the ventral roots, which are invested by the same membranes, should escape.

The author concludes by stating that specific therapy in *tabes* should have for its object the reappearance of normal fluid reactions. Intraspinial injections may be necessary to attain this object. Conversely, intraspinal treatment is contra-indicated when the fluid shows no inflammatory reactions. The paper contains a summary of the theories of the pathogenesis of *tabes*, and a valuable account of recent experimental work on cord degenerations.

R. M. S.

[10] The diagnosis of syphilis by the method of Sachs-Georgi (*Le diagnostic de la syphilis par le procédé de Sachs-Georgi*).—B. GALLI-VALERIO. *Corresp.-Blatt f. Schweiz. Aerzte*, 1919, xlix, 1977.

This method is based on the observation that a mixture of syphilitic serum and cholesterolized organic extract causes the formation of flocculi of globulin, more or less macroscopic, which are precipitated and collect in the bottom of the tube in which the test has been performed. The cholesterol extract has the following formula: 100 c.c. of an alcoholic extract of ox-heart (1 gm. of heart to 5 c.c. of alcohol), 200 c.c. of alcohol, 13.5 c.c. of a 1 per cent alcoholic solution of cholesterol. When the test is to be performed, one part of this extract is mixed with one part of a 0.85 per cent solution of sodium chloride, the tube is gently shaken, and four parts of the same physiological solution are then added rapidly. The opalescent liquid obtained thereby should be utilized at once for the reaction. It is very important to use only saline solution of 0.85 per cent, and it should be fresh, sterile, and clear. The control serums should also be fresh and clear; they must be inactivated by being kept at 55° to 56° C. for half an hour.

The very simple technique is as follows: To 1 c.c. of the patient's serum diluted ten times with the 0.85 per cent saline solution, there is

added  $\frac{1}{2}$  c.c. of the extract diluted in the way described above. After thoroughly mixing, the tube is placed in the incubator at  $37^{\circ}$  C. for two hours, and then for twenty, twenty-four, or forty-eight hours at room temperature. The results can be controlled more quickly if, after three or four hours in the incubator, the tubes are centrifuged. At the same time a control reaction is performed with normal serum and saline solution, mixed with the extract by the same technique. If an agglutinoscope is not available, the tubes may be examined on the black stage of a Leitz dissection microscope, using a No. 8 objective. Galli-Valerio examined 241 serums from suspected cases of syphilis. In 77.59 per cent the Sachs-Georgi and Wassermann reactions gave similar results: in 20.74 per cent the results were discordant, owing to the fact that the Wassermann reaction apparently remains positive for longer periods than that of Sachs-Georgi.

The author concludes that this new reaction is of great diagnostic value, and may ultimately replace the more complicated method of Wassermann.

R. M. S.

[11] Study of the cerebrospinal fluid in the different periods of syphilis.

—GEORGES CORNAZ. *Jour. Nerv. and Ment. Dis.*, 1919, xlix, 282.

In this paper Cornaz gives the results of over 500 examinations of the cerebrospinal fluid in syphilitics at all stages, taking as the normal lymphocytosis 5 per c.mm., and .02 to .03 per cent as the normal albumin content. He points out how frequent and early is the extension of the syphilitic infection into the meninges, as demonstrated by an increase in lymphocytosis in the cerebrospinal fluid in cases of hard chancre alone without secondary manifestations. The lymphocytosis may occur when the percentage of albumin is normal and the fluid Wassermann is negative, and even when the blood Wassermann is still negative. The increase in cells is most constant in those cases in which the fluid Wassermann is positive, and may occur either independently of, or parallel with, the increase of the albumin. In neurosyphilis both cells and albumin are constantly increased, excepting in a certain percentage of cases of tabes. The fluid Wassermann is positive in a considerable percentage of cases showing only secondary manifestations, and in a lower percentage in tertiary.

In hereditary syphilis the cerebrospinal fluid is normal in cells, albumin, and Wassermann, with the Wassermann positive in the blood. In meningeal neurosyphilis the Wassermann is positive in every fluid, but is frequently negative in the blood. In tabes not quite a third have positive Wassermans in both blood and fluid. Treatment increases the positive Wassermann in the latter to 100 per cent, leaving that in the blood unaffected. In general paresis the Wassermann is positive in every case in both blood and cerebrospinal fluid.

Treatment (arsenobenzol or neosalvarsan) definitely lessens the lymphocytosis, especially in the primary and secondary periods, and also in tabes, but does not affect the albumin: at the same time it increases the percentage of positive Wassermans in the cerebrospinal fluid, leaving the blood unaffected. Mercurial treatment seems to modify the increased lymphocytosis much more slowly.

M. A. BLANDY.

- [12] **Histologic evidence of the path of invasion of the brain in general paralysis.**—SAMUEL T. ORTON. *Arch. of Neurol. and Psychiat.*, 1919, i, 285.

AN investigation of the larger cranial vessels in their extracerebral course, from nine cases of general paralysis.

The author refers to the predilection of the syphilitic virus to affect especially the frontal pole and anterior parts of the convexity of the brain. In a comparative study of fifty cases of paresis made in 1913, he found that the areas most severely involved were those supplied by branches of the internal carotid artery, and he subscribes to the view that the path of invasion by the spirochaetes is along the perivascular lymphatic channels, and the mesodermal tissues of the perivascular spaces. The material in the present investigation was taken from the intracranial but extracerebral portions of the carotid and basilar arteries, and in some cases from the carotids in the neck.

The lesions encountered fell into two groups: (1) Those in which the process was evidently stationary; and (2) Those which showed evidence of progressive chronic inflammation. Both types of lesion were present in eight cases. Orton concludes that the lesions found were quite comparable in their type with those of the cerebral vessels, though modified somewhat by the different anatomical conditions. He regards the disease process as of the nature of "a persistent vascular infection with a very even balance between the invasive power of the parasite and the resistance of the host, lasting over a number of years, which constitutes the incubation period of paresis, with ultimate invasive spread in multiple small foci to the brain parenchyma".

In his description of the arterial lesions the author leaves the reader in some doubt as to which particular group of vessels he is specifying. In view of the relative integrity of the occipital poles in this disease, an account of the histological appearances in the vertebral and basilar arteries, and a comparison of these with the morbid changes in the carotid system, would have added to the value of this contribution.

R. M. S.

- [13] **The origin and nature of disseminated sclerosis** (Étude sur l'origine et la nature de la sclérose en plaques).—G. MARINESCO. *Revue neurol.*, 1919, xxvi, 489.

THIS paper contains: (1) A review of the case for an infective origin of disseminated sclerosis based upon data before 1913; (2) A brief summary of recent work by others upon the subject; (3) An account of the author's own researches.

1. From the nature and distribution of the histological lesions found in the central nervous system, and from the clinical course of the disease, the writer argues that it is primarily an inflammatory process, and that the cause is an infective agent. He considers that the vascular lesions are primary, consisting in the first place of perivascular infiltration with lymphocytes and plasma-cells, especially in the adventitial sheaths of the veins, and that the abnormalities of nervous tissue and neuroglia are secondary



to this. The accumulation of macrophages is secondary to degeneration of myelin. When the inflammatory process extends to the surface it invades the pia-arachnoid. The localization of the lesions in the white matter is explained by the distribution of the vessels, particularly the small veins.

Marinesco quotes the opinion expressed by P. Marie that disseminated sclerosis is the result of a disseminated arteritis occurring in the brain and cord in the course of various infections—typhus, scarlatina, pneumonia, etc.—a view which has been supported by many German authorities. He considers that the frequent occurrence of lesions around the Sylvian aqueduct favours the theory that the cerebrospinal fluid is the vehicle of the virus, and proceeds to assert his belief that the latter reaches the central nervous system by means of the lymphatics (citing in his support the early cell reaction in the adventitial sheaths of the veins), and causes malnutrition and degeneration of the myelin sheaths, leaving the axis cylinders more or less intact.

He has not been able to confirm Ribbert's observation of vascular thrombosis in disseminated sclerosis, but has always found the intima intact.

The progress of the disease, with its remissions and exacerbations, is more in accord with the infective than the toxic theory of origin, being due to the periodic multiplication and spread of living micro-organisms. The endogenous theory of Strümpell and Müller is untenable. Siemerling and Raceke have maintained that the disease is preceded by signs of general infection, such as fever and rigors, and these have been put down to influenza, etc. But it is more probable that it is a specific disease *sui generis*.

There is no true resemblance between the nature of the lesions and those of syphilis, and no observers have succeeded in making out a case for a syphilitic origin on the basis of Wassermann's reaction.

2. Briefly referring to the work of Bullock, who succeeded, by inoculation into rabbits of the cerebrospinal fluid of a case of disseminated sclerosis, in producing in them certain nervous symptoms, the author passes to that done by Kuhn and Steiner in 1917. From recent cases of disseminated sclerosis they injected cerebrospinal fluid, blood, or a mixture of the two, into guinea-pigs and rabbits, the routes of choice being intraperitoneal and intra-ocular. After three to fourteen days they obtained in most of the animals symptoms of motor paresis and inco-ordination, ending in some cases in paralysis and death. Positive results were obtained from all of four cases of the disease, but not in all the animals inoculated. Examination of the blood of infected animals with dark-ground illumination revealed spirochaetes resembling those of Weil's disease. These were also seen in appropriately stained sections within the vessels of the liver. The transmission of the virus to rabbits was also confirmed by Simon, subdural inoculation of the cerebrospinal fluid of patients with disseminated sclerosis being followed by paralysis and death.

Finally, in March, 1918, Siemerling announced the discovery, under dark-ground illumination, of spirochaetes resembling those of Kuhn and Steiner in the brain of a patient dying of disseminated sclerosis.

3. In October, 1918, the author performed the following experiments.



Two cases of disseminated sclerosis were selected from the Salpêtrière clinic, one of six, the other of five years' duration, the latter showing an exacerbation of symptoms at the time. The cerebrospinal fluid of these two cases was injected into six guinea-pigs by intracerebral, intraperitoneal, and intrathecal routes, and of these the two inoculated intracerebrally showed, three to four days later, symptoms of paresis, especially of the hind limbs. Cerebrospinal fluid obtained from these animals by puncture of the fourth ventricle revealed under dark-ground illumination a number of spirochaetes of the type described by Kuhn and Steiner. Their presence was confirmed on examination by Pettit and Roux. Pettit, inoculating fresh guinea-pigs with the spirochaete-containing fluid, obtained negative results, and later experimental inoculations of the cerebrospinal fluid of both patients into guinea-pigs and rabbits were all negative: this, in the opinion of the author, means only that the spirochaete is not constantly present at all stages of the disease. Recent experimental work on disseminated sclerosis, therefore, suggests the existence of a transmissible virus which is a specific spirochaete distinct from the *Spirocheta pallida*.

In view of the possible importance of his work it is unfortunate that the author does not give protocols of his experiments, the details of which are somewhat meagre. No bibliography is appended.

C. P. SYMONDS.

[14] The paths of spread of bacterial exotoxins, with special reference to tetanus toxin.—F. H. TEALE and DENNIS EMBLETON. *Jour. of Pathol. and Bacteriol.*, 1919, xxiii. 30.

THE older work on the paths of spread of tetanus toxin was reviewed by the use of various methods. It was found:—

1. That although tetanus toxin ascends to the central nervous system by way of the axis-cylinders of the nerves, it also, to a very great extent, passes up the nerves to the cord by way of the perineural lymphatics. Blocking of the latter paths greatly delays, and in some cases completely prevents, the occurrence of tetanus in the part corresponding to the nerve whose lymph path has been blocked. This blocking was achieved by injections into the nerve, not only of tetanus antitoxin, but also of horse serum and egg-albumen. It could also be effected by injecting iodine into the nerve ten days before the injection of tetanus toxin.

2. Although tetanus toxin passes rapidly into the lymphatics of the injected limb, and can be demonstrated in the glands at the root of the limb and in the chyle within an hour after injection, it does not reach the nervous system directly from the blood-stream. Blocking of the lymphatics of a limb prevents that limb being involved in tetanic spasms, even after an intravenous injection of tetanus toxin large enough to cause generalized tetanus.

3. Section of all the ventral roots of a limb prevented the onset of tetanus, which would otherwise have resulted from the injection of a large dose of toxin into the nerve of the limb. Colloidal dyes injected into a sciatic nerve were seen to spread to the cord along the ventral nerve roots, but to be stopped at the dorsal root ganglion. It seemed, therefore, to

be demonstrated that the dorsal root ganglia have a blocking action on tetanus toxin similar to that exerted on colloidal dyes, and the rarity of tetanus dolorosus is thus explained.

4. Although the action of nervous tissue in neutralizing tetanus toxin made it impossible directly to test whether the toxin passed from the capillaries into the brain substance, the following considerations suggested that it did not do so: (a) It was impossible even by massive intravenous doses of toxin to produce symptoms of cerebral tetanus similar to those following intracerebral injections of minute amounts of toxin. (b) Anaphylaxis experiments with horse serum showed that no sensitizing effect could be produced in guinea-pigs by emulsions of brain tissue from other guinea-pigs which had received large intravenous doses of horse serum. A sensitizing effect was, however, produced by emulsions of liver, spleen, and omentum from the same animals. It therefore seems to be proved that substances with as large a molecule as horse serum cannot pass out from the capillaries into the central nervous system; nor does tetanus toxin pass through the choroid plexus to the cerebrospinal fluid.

5. The assumption that tetanus antitoxin can pass from the sub-arachnoid space into the tissues of the cord was negatived by three experiments in which large doses of tetanus antitoxin were injected into the sub-arachnoid space thirty-six to forty-eight hours after the injection of tetanus toxin into the hind leg. In none of these was there any reduction in the spasms of the affected limb. Nor was any such reduction obtained by injecting antitoxin into the sciatic nerve high up. There was therefore no evidence that antitoxin spread up the neural lymphatics to the cord.

J. G. GREENFIELD.

[15] **The pathological examination of forty intracranial neoplasms.—**

J. G. GREENFIELD. *Brain*, 1919, xlii, 29.

A SERIES of 40 successive intracranial neoplasms, 3 of which were removed during life, was examined pathologically. The list comprised 2 tuberculomata, 1 granuloma (? gumma), 10 endotheliomata, 3 perivascular sarcomata, 11 gliomata, 3 neuroblastomata, 1 ganglioneuroma, and 6 cases of acoustic-nerve tumours. One anomalous case of meningeal infiltration with tumour-like cells was also included. In this series tumours of nervous tissue, including gliomata, neuroblastomata, and acoustic-nerve tumours, formed 52.5 per cent, and tumours of mesoblastic origin 40 per cent. The remainder is made up by the tuberculomata and granuloma, the small proportion of which is accounted for by their low rate of mortality.

In the case of ganglioneuroma included in the series the tumour seemed to arise from the pituitary and gave rise to symptoms of acromegaly. In two of the neuroblastomata there was no evidence of nerve cells or fibres, but the arrangement of large pyriform cells around the vessels seemed to justify the classification adopted. These cells seemed to be related to glia cells rather than to nerve cells, and to represent an early stage in the development of the neuroglia.

Among the acoustic-nerve tumours was a case of bilateral acoustic-nerve tumour associated with multiple neurofibromata of the dorsal roots,

some of which had invaded the cord, and also with a large psammoma on the occipital cortex. This case appeared to be closely allied to one described by Verocay in 1910. There seemed to be no doubt that all these tumours of the acoustic nerve were of one type, and should be classed along with neurofibromata occurring in other situations, which they resemble histologically, and along with which they occur sometimes. A general agreement on this point would avoid the misleading use of names such as 'myxofibroma' and 'fibro-glioma' for tumours of the acoustic nerve, which, in the writer's opinion, are derived from the cells of the nucleated sheath of Schwann.

AUTHOR'S ABSTRACT.

### VEGETATIVE NEUROLOGY AND ENDOCRINOLOGY.

- [16] The pilomotor reflex (Le réflexe pilomoteur).—ANDRÉ THOMAS. *La Médecine*, 1920, i, 283.

PILOMOTOR reflexes are easily elicited, but they vary widely in different individuals, and even in the same healthy person under different conditions. Researches on wounded men confirm the results of Langley's experiments. The centres for the head and neck are in the first three dorsal segments: for the upper limb in the 4th to 7th dorsal segments; for the lower limbs in the 9th dorsal to 2nd lumbar. Alterations in lesions of the cord and nerves are described. The reflexes are modified in all lesions of the sympathetic, and vary with the nature of the lesion. In spite of their extreme variability, the ease with which they can be examined makes them very useful in cases where investigation of the state of different parts of the sympathetic nervous system is called for.

W. J. ADIE.

- [17] On angioneurotic (acute circumscribed) œdema [Ueber das angio-neurotische (acut umschriebene) (Edem)].—G. BOLTEN. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 201.

THE name Quincke's disease, used in Germany, is incorrect and unjust, for the condition is not a disease but a syndrome, and the first exact description was given by Graves. Ten new cases are described by Bolten. The main symptom has fairly constant characteristics, but the accompanying phenomena are very varied. Urticaria, intermittent hydrops of the joints, acrocyanosis, erythromelalgia, acroparæsthesiæ, idiosyncrasies to drugs and food, even gout and migraine, must be considered as related to, or analogous with, angioneurotic œdema. The underlying cause in all the above-mentioned conditions is the same—sympathetic hypotonia. Treatment, according to the author, though protracted, is simple and rational: increase the tone of the sympathetic by thyroid or other glandular extracts, and the results will be very satisfactory.

W. J. ADIE.

- [18] Lipodystrophia progressiva (La lipodystrophie progressive).—L. BOISSONAS. *Revue neurol.*, 1919, xxvi, 721.

THIS condition is characterized by a progressive disappearance of the subcutaneous fat in the face and upper part of the body, followed at a later

stage by a pronounced increase of fat below the iliac crests. Barraquer published the first case in 1906, and Simons gave it its name. All the published cases, twenty-two in number, occurred in the female sex, except two described in the paper. The age of onset varies from 5 to 42, and the etiology and pathology are unknown. No post-mortem examination has yet been recorded. The wasting of the face first attracts notice. The fat of the mammary gland escapes. The bones and viscera are normal, there is no pain, there are no signs of disease in the nervous system, and the general health remains good. The increase of fat below the waist commences usually in the gluteal region, and travels down the legs to stop short at the ankles. The carbohydrate tolerance is normal, and the reactions to pilocarpine and adrenalin present no unusual features.

Six cases of disappearance of fat without hypertrophy in the lower limbs are described ('atrophic graissense progressive'), all in the male sex.

A hypothetical discussion as regards pathogenesis completes the paper. The condition cannot be satisfactorily explained by disturbances in the functions of the endocrine glands, which are associated only with *generalized* adiposis. The hypertrophy would appear to be compensatory in character, such as is seen in the nuchal region of the hibernating hedgehog. It is pointed out that in woman there are seven principal regions where fat is normally deposited, viz., neck, mammary region, abdomen, loins, pubic region, buttocks, and thighs. In lipodystrophia the connective-tissue cells in the first five regions have lost the property of storing fat, while in the last two the fixation of fat is exaggerated.

Mention is made of the fact that the hind leg of an animal in which the sciatic nerve has been cut contains two to seven times more fat than the sound limb. A case of Turney's is also quoted in which the upper part of the body was excessively fat and the lower part thin, and attention is directed to instances of hemi-obesity, and to hereditary trophœdema of the legs (accumulation of water as opposed to fat). The author concludes that the only possible explanation lies in some disturbance of innervation of the tissues, and suggests as a possible site for the lesion the region of the hypothalamus and third ventricle.

An excellent bibliography is appended.

J. L. BIRLEY.

- [19] Oculosympathetic syndrome of Claude Bernard-Horner as the result of shell concussion. Phenomenon of ocular adduction provoked by every peripheral stimulus (Syndrome oculo-sympathique de Claude Bernard-Horner par commotion d'obus. Phénomène de l'adduction oculaire provoquée par toute excitation périphérique).—LÉRI and THIERS. *Revue neurol.*, 1919, xxvi, 808.

THE subject of this paper was first blown up by a shell in July, 1916, as a result of which both tympanic membranes were ruptured: thereafter he suffered from headache, vertigo, and blowing noises in the left ear. In December, 1917, he was blown up a second time, and on rising suffered from



violent vertigo and unsteadiness of gait. On examination shortly afterwards he complained of a constant tendency to deviate to the left, which also appeared in his gait. Romberg's test resulted in a 'statuesque' fall backwards whatever the direction of the face. Aural inspection revealed a small perforation of the left drum, with a considerable degree of deafness, air conduction being better than bone, and Weber lateralized to the left. There was therefore evidence of damage to the middle and internal ear on this side. On the left also he showed the signs of paralysis of the sympathetic supply to the eye—myosis, narrowing of the palpebral aperture, and enophthalmos. Ophthalmic examination was negative, but nystagmoid jerkings were apparent on conjugate deviation upwards and to the right. No abnormalities were detected in the reflexes, sensations, or cerebellar functions. The Wassermann test was negative.

No evidence could be found to show that the oculosympathetic palsy had existed before the concussion, and in support of the possibility of this being the cause the authors quote another case recorded of isolated oculo-sympathetic paralysis following similar trauma. They admit that the pathology of their case is difficult of explanation, suggesting alternatively a lesion of the sympathetic fibres connected with the vestibular and oculomotor nerves, or a minute hemorrhage in the dorsolateral region of the medulla.

In the performance of the caloric tests they found that the introduction into the left auditory meatus of a wisp of cotton-wool soaked in cold water resulted in complete adduction of the left eye, contraction of the muscles innervated by the lower branch of the right facial, and retro-pulsion, with complaint of vertigo and diplopia. Further exploration demonstrated that the phenomenon of ocular adduction could be provoked equally well by stimulus of any kind applied to any part of the body, e.g., plunging the right hand into a bowl of hot or cold water, pinching the skin, etc. On withdrawing the stimulus or maintaining it for more than twelve seconds, they observed the eye return to the normal position.

They then examined twenty-three other patients, all with nervous lesions, as controls. One case only, a man with an old-standing nerve deafness, the result of a fractured base, showed the phenomenon of ocular adduction on the same side as the deafness. Among the negative controls were two with the Babinski-Nageotte syndrome, both having oculo-sympathetic palsy on the affected side. The inference is that in the original case the phenomenon of adduction is to be associated, not with the sympathetic, but with the labyrinthine lesion.

The authors refer to a number of cases recorded, having some resemblance to their own, in which bilateral adduction of the eyes has been produced by vestibular stimulation, but point out that the essential novelty of the phenomenon they have described is its comprehensive reflexogenous area. They suggest that it may be evidence of an underlying disturbance of balance between the ocular muscles which is intensified and brought into view by reflex stimulation.

C. P. SYMONDS.



[20] Hereditary and familial exophthalmic goitre (Goitre exophthalmique héréditaire et familial). — J. LERMOYET. *Revue neurol.*, 1919, xxvi, 20.

In a family of sixteen members, seven in three generations showed the complete picture of Graves' disease. Four of them, seen by the author, are described. As a rule similar heredity is transmitted through the females, but these patients were cousins through their fathers.

W. J. ADIE.

### SENSORIMOTOR NEUROLOGY.

[21] A pathologico-anatomical classification of motor disturbances of corpus-striatum origin (Erster Versuch einer pathologisch-anatomischen Einteilung striärer Motilitätsstörungen nebst Bemerkungen über seine allgemeine wissenschaftliche Bedeutung). CECILE and OSKAR VOGT. *Jour. f. Psychol. u. Neurol.*, 1918, xxiv, 1.

THE writers explain the absence, in certain striate lesions, of the symptoms of one or other variety of involuntary movements, by severe concomitant involvement of the corticospinal paths, a view which has already been put forward by others and has much to commend it. Negatively, they do not know of any case of the syndrome of the corpus striatum being present in spite of pyramidal disease, but in the reviewer's opinion this statement should not be taken too absolutely. The Vogts distinguish four types of pathological change in the corpus striatum.

1. *État marbré* (status marmoratus) — a 'marbled' condition of outfall of nerve-cells in irregular fashion and their replacement by nests of the finest myelinated fibrils (*not* glial overgrowth). It may be regarded as a dysplasia, a developmental defect, which the Vogts are inclined to associate with asphyxia neonatorum. They have examined six cases of *état marbré*, which all began in earliest infancy and were associated in each instance with the striate syndrome of choreo-athetoid movements, or tremors, associated movements, variable tonic muscular spasms, involuntary laughing and crying, etc., without genuine muscular paralysis. Some improvement in the cases was noted up to the fifth year of life. They were bilaterally spastic, but not in any sense paralyzed, and are comparable to some cases of Little's disease. The authors, in short, limit the latter conception strictly to spasticity without paralysis, and couple with it the condition of 'athétose double', which they consider a "more severe form of Little's rigidity": the two they separate rigorously from infantile cerebral hemiplegia or double hemiplegia.

2. *État fibreux* (status fibrosus) — a shrunken condition of the corpus striatum, as a result of which those myelinated fibres that remain seem unusually closely set, so that the ganglion gives a spurious appearance of being richer in fibres than ordinarily. With this the writers associate a slow progressive bilateral chorea without psychical impairment: they agree with other observers who have demonstrated the connection between disease of the corpus striatum and the involuntary movements of Huntington's chorea.

3. *Total necrosis* of the corpus striatum. In this class are placed progressive lenticular degeneration (Wilson's disease), and probably other subacute processes; they are connected also with changes in the liver.

4. *Acute lesions*: i.e., hemorrhages, acute softenings, inflammatory processes, etc., not of a familio-hereditary or degenerative character.

Other disease-processes may include in their incidence the corpus striatum, e.g., so-called pseudosclerosis, tubercle sclerosis, general paralysis, paralysis agitans, etc.

WILSON.

[22] **Torsion-dystonia** (*torsion spasm, dystonia musculorum deformans*) [*Torsionsdystonie (Dystonia musculorum deformans, Torsionsspasmus in monographischer Bearbeitung unter Mittheilung von zwei eigenen Beobachtungen)*].—K. MENDEL. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 309.

MENDEL's communication is a complete little monograph on the disease known by the various names of dystonia musculorum deformans or dysbasia lordotica progressiva (Oppenheim), torsion-neurosis (Ziehen), progressive torsion-spasm in children (Flatau and Sterling), tortipelvis (Fraenkel), the Ziehen-Oppenheim variety of dystonia lenticularis (Thomalla). Mendel criticizes each of these denominations adversely, and proposes 'torsion-dystonia', which is satisfactory enough in a way. The important thing is to decide on one term, if practicable, and to stick to it.

Torsion-spasm or torsion-dystonia is an affection of comparative rarity, some 33 cases having been recorded since Schwalbe and Ziehen drew attention to it in 1908 and 1910. Much more common in the male than the female, it occurs almost exclusively in Polish Jews, though this is not a *conditio sine qua non*. Apparently some live cases outside the Jewish race have been described. An occasional familial element is traceable. The disease makes its appearance as a rule between 10 and 13, but it has been seen at 8, while one of Mendel's patients was 45. It is characterized by the gradual onset of involuntary movements, described comprehensively if vaguely by Mendel as "a mixture of choreic, athetoid, tic-like, Parkinsonian-like movements", at one time resembling one of these, at another time some other; they are clown-like, grotesque, bizarre, pointless, tonico-clonic, and especially apt to become tonic; coupled with this tonizing element is the characteristic tendency to twisting or torsion-like contraction of trunk and limbs. The face usually escapes. The movements more commonly affect the trunk, and proximal rather than distal segments of limbs, and disappear in sleep. There is a noteworthy degree of spine-twisting and lordosis in almost every case. In addition to the involuntary movements, the peculiar changing nature of the muscle tonus is a prominent feature: marked hypotonia is followed by hypertonia in the same group, resulting in a transient immobilization of the mobile spasm as in athetosis. Mendel says that passive movement reveals an obvious hypotonia, and that, with repetition of the movement, hypertonus, spasm, and tonico-clonic involuntary movements set in. The deep reflexes are reduced, occasionally exaggerated; pyramidal disease is conspicuous by

its absence, except in one or two cases considered doubtful by Mendel. Negatively, there are no muscular atrophy, speech defects, paralyzes, sphincter impairment, or intellectual defect. The affection is to be distinguished from double athetosis, chorea, tic, juvenile paralysis agitans, myotonia, Wilson's disease, and pseudosclerosis. It runs a chronic course, and cures are at present unknown. Its pathology is undetermined, for Mendel criticizes Thomalla's diagnosis in his case (see this Journal, p. 87), considering it to belong definitely either to Wilson's disease or to pseudosclerosis.

There are full references to the literature.

WILSON.

- [23] **A case of torsion-spasm, and its relation to double athetosis, Wilson's disease, and pseudosclerosis** (Ein Fall von Torsions-spasmus mit Sektionsbefund, und seine Beziehungen zur Athétose double, Wilson'schen Krankheit, und Pseudosklerose).—THOMALLA. *Zeits. f. d. g. Neurol. u. Psychiat.* 1918, xli, 311.

THE patient was a boy, age 14, with some of the characteristic symptoms of torsion-spasm ('dysbasia lordotica progressiva', 'dystonia musculorum deformans'), viz., irregular, involuntary, mobile spasms of the trunk and limbs, producing almost clown-like distortions of the body, especially of pelvis and spine. As has been noted in most, though not all, of the recorded cases, he was a Polish Jew.

This case of Thomalla's is interesting because of the pathological findings, viz., a small cirrhotic liver, and a bilaterally shrunken and softened putamen, with secondary glia-formation, especially of glia nuclei; the parenchyma of the putamen had almost entirely disappeared, but the globus pallidus was practically normal, and the caudate nucleus seemed unchanged. Thomalla gives excellent clinical photographs, and a good discussion on the problems presented by his case, especially in its pathological similarity to progressive lenticular degeneration. His conclusion is that under the general term 'dystonia lenticularis' might be included double athetosis, pseudosclerosis (Westphal-Strümpell), Wilson's disease, and torsion-spasm.

It should be stated that some doubt has been expressed as to the classification of this case in the group of torsion-spasm (see this Journal, p. 86).

WILSON.

- [24] **Bilateral athetosis and allied conditions: syndrome of the corpus striatum** [Ueber doppelseitige Athetose und verwandte Krankheits-zustände ('striäres Syndrom')].—WESTPHAL. *Arch. f. Psychiat.*, 1919, lx, 361.

THE patient, a man, age 43, had suffered for several weeks from athetoid movements of the face and the left arm and leg, with variable attacks of spasm in the trunk and limbs, often curiously rhythmical: his attitude of flexion and his general rigidity resembled those of paralysis agitans. Further, he showed on occasion a sort of torsion-spasm of the trunk, neck, and proximal segments of the limbs. The Wassermann test was negative in blood and spinal fluid, though infection was admitted; the abdominal

reflexes were active, and Babinski's plantar reflex was absent. Some six weeks later the patient died.

Pathological examination revealed bilateral softening of vascular origin in the lenticular nucleus, with evidence throughout the brain of lymphocytic and plasma-cell perivascular infiltration, and changes in the walls of the blood-vessels. The liver showed commencing cirrhosis.

The case is one illustrating extrapyramidal motor disease, and lends support to the view associating certain forms of involuntary movements and spasmodic rigidity with disease of the corpus striatum. Westphal describes two other cases, in one of which he correlates a clinical state of paralysis agitans sine agitatione with an asymmetrical bilateral softening in the putamen found at the necropsy, of syphilitic origin; and he adopts the general attitude that paralysis agitans, progressive lenticular degeneration, pseudosclerosis, perhaps also Oppenheim's dystonia musculorum deformans or torsion-spasm, are definitely to be assigned to the lenticular nucleus and corpus striatum.

WILSON.

- [25] **Choreic movements from a lesion of the superior cerebellar peduncle** (Ein Beitrag zur Bindearmchorca).—BREMME. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 107.

A WOMAN, age 40, who had her left breast removed for carcinoma, began, four days after the operation, to suffer from choreiform movements of the whole of the right side, and from bilateral facial chorea; occasional choreic movements were observed at first in the left arm and leg also. Eleven days later the left limbs became paresed, and at a later date bulbar symptoms made their appearance. The chorea of the right side was associated with much hypotonia of the muscles. Other nervous symptoms need not here be particularized, with the exception that the patient, in Bárány's pointing test, always made an error towards the left with the right arm.

Pathologically, three small secondary carcinomatous metastases were found. One was in the left regio subthalamica, about the size of a pea, involving in part the ansa lenticularis and Forel's field. Bremme gives several reasons against associating this lesion with the patient's choreiform movements, which are ascribed with greater justification, in the author's opinion, to a larger metastasis almost completely destroying the right superior cerebellar peduncle in the mid-brain, under the corpora quadrigemina, just where its fibres commence to cross the fibres of the left one. A small tumour was also found in the extreme lateral edge of the right cerebellar hemisphere (lobulus semilunaris superior), to which the pointing error is attributed. The patient showed no tremor, it appears, and it may be noted that the red nuclei were normal. Possibly the chorea produced by the peduncular tumour was subsequently accentuated by the lesion in the left regio subthalamica.

WILSON.

- [26] **Epidemic (lethargic) encephalitis**.—WM. HOUSE. *Jour. Amer. Med. Assoc.*, 1920, lxxiv, 372.

THIRTEEN cases are enumerated in which the diagnosis was certain, while four where there was some doubt as to diagnosis are mentioned. There



were no histories of preceding influenza, and there was no example of more than one case in the same house. No evidence of a contagious element in the disease was forthcoming. The cases are divided into two types, roughly:

1. Slow onset, in 10 of the 13. This type had ophthalmoplegia, followed about a week later by a lethargic stage. The writer suggests an infection of the region of the pons as a starting-point for this type.

2. Type with rapid onset, characterized by headache, delirium, and little evidence of ocular palsies. For this type an infection of the frontal lobes via the ethmoid region is put forward for consideration.

Individual symptoms: euphoria, followed by depression in convalescent stage. Apathy rather than lethargy. Diplopia, present in 11 cases, with vague palsies of other cranial nerves, the external eye muscles showing a paresis rather than a clear paralysis such as occurs with definite lesions of the nerves or their nuclei. Temperature: the pyrexia varied from  $101^{\circ}$  to  $104.6^{\circ}$ . Rigidities not real as in meningitis. Skin eruptions: discrete pinhead petechiae. Cerebrospinal fluid: increased pressure, sterile on culture: cell-count varied from 6 to 105 mononuclears. Leucocytosis in blood: 3 out of 12 examined, 15,000 to 20,000. Mortality: 4 patients died out of 13. No post-mortem details available.

J. LE FLEMING BURROW.

[27] Fifteen cases of involuntary movements following influenza and encephalitis lethargica (Quinze cas de mouvements involontaires apparus à la suite d'épisodes grippaux et d'encéphalite léthargique).

—PIERRE MARIE and G. LÉVY. *La Médecine*, 1920, i, 270.

SINCE the autumn of 1918 a number of cases of involuntary movements following a febrile illness have come under notice. The following forms were observed: fine oscillatory movements of the limbs, most marked distally; slow regular movements of wide range, sometimes synchronous in the upper and lower limbs, most marked proximally; movements resembling Sydenham's and Huntington's chorea; and in two cases extraordinary rhythmical contortions of the trunk which interrupted progression and ended with a lateral eversion of the head and an antagonistic gesture. The movements in any form may be confined to one side. Several cases presented the picture of the rigid form of Parkinson's disease. The movements began two or three months after the febrile illness: in most cases they were still present a year after the onset. They tend to disappear, but very slowly, and not always completely.

W. J. ADIE.

[28] The Australian epidemic of acute encephalomyelitis: a consideration of the lesion.—J. BURTON CLELAND and A. W. CAMPBELL. *Jour. Nerv. and Ment. Dis.*, 1920, li, 113.

EARLY in 1917, and again in 1918, a number of cases of a peculiar form of encephalomyelitis occurred in certain country districts of Australia. The disease was acute, and often abrupt in onset, with a mortality of 70 per cent. The symptoms included pyrexia, coma, convulsions, and rigidity; in most cases there was no evidence of paralysis. The affection was conveyed by intracerebral inoculation to monkeys, from monkeys to sheep,



and from these back to monkeys or to other sheep. It was also conveyed to a calf and a horse. Histologically there was found distention of the perivenous sheaths by lymphocyte-like cells throughout the brain and cord, most often and most intensely in the corpus striatum, pons, and medulla.

The authors consider that in the group of diseases to which the Australian disease belongs, this cellular response around the veins is the result of a chemical irritant, and that the symptoms are due, not to the mechanical presence of the virus, nor immediately to its toxins, but to the effects of the cellular response itself. In an epidemic of one of the diseases of this group, e.g., of acute poliomyelitis, the paucity of cases is due chiefly to the fact that many individuals react to the virus to such a slight degree that no interference with function results; in a few the reaction, i.e., the cellular response, is great, and interference with function is prominent.

W. J. ADIE.

- [29] On the epidemic acute and subacute non-suppurative inflammations of the nervous system prevalent in the U.S. in 1918-19. Encephalitis, encephalomyelitis, polyneuritis, and meningo-encephalomyeloneuritis.—LEWELLYS F. BARKER, ERNEST S. CROSS, and STEWART V. IRWIN. *Amer. Jour. Med. Sci.*, 1920, clix, 157.

EIGHT cases are described fully, with special opinions upon the various systems, and with full details of the clinical pathology of the blood, cerebro-spinal fluid, etc. Four gave a history of recent 'influenza'. Six had double vision or some paresis of cranial nerves, and one a masklike face such as would occur in Parkinson's disease. One had root pains in the body, while half the cases were drowsy or apathetic. The Wassermann reaction with blood and spinal fluid was negative, and the average leucocytosis was about 10,000 per c.mm. in the blood. There was some excess of globulin in the spinal fluid in two cases. No new features of the disease are brought forward, and the clinical details are loosely put together, so that no clear picture of the state of the patients is presented.

J. LE FLEMING BURROW.

- [30] A benign form of the Brown-Séquard syndrome (Sur une forme bénigne du syndrome de Brown-Séquard).—S. GOLDFLAM. *Revue neurol.*, 1919, xxvi, 673.

THIS is an interesting paper in which a general historical account is given of the pathological conditions which may give rise to a hemileSION of the cord. These were originally looked upon as syphilitic in origin, until Gowers and Horsley demonstrated that they might be due to tumours, a condition amenable to surgical interference. The author very properly points out that the diagnosis of spinal tumour is not so easy as was once thought, and refers to the pathological conditions which may simulate (or complicate) tumour. Of these, he mentions localized simple meningitis, meningitis serosa chronica circumscripta, and arachnoperineuritis chronica serofibrinosa. These conditions cannot be said to have a very

definite pathogenesis or clinical picture: they are associated with pressure symptoms by reason of the liquid tumours to which they give rise. Spinal tumour may be simulated occasionally by disseminated sclerosis, especially in the region of the conus medullaris, and rarely by ordinary myelitis. On the other hand, it not infrequently happens that spinal tumour is confidently diagnosed and yet no pathological condition of any kind is found at operation, or even, as in a case described by Nonne, on histological examination of the cord.

Another condition simulating tumour was described by Henneberg under the name myelitis funicularis; this may be non-progressive or even regressive. The five cases of which details are given in the paper, as well as similar ones described by Oppenheim, appear to come under this heading. They are characterized by the following group of symptoms: slow onset, usually with thermal paræsthesiæ in one leg, or diffuse, not radicular, pains, weakness in the opposite leg, impotence, and mild urinary incontinence. The physical signs are those of a pyramidal lesion in one leg, diminution of painful and thermal sensations in the other, negative X-ray, normal cerebrospinal fluid, and negative Wassermann. The age of onset varied between 29 and 50, and all the patients were Jews. The course is typical: the condition reaches its maximum in a few months, and then gradually improves, the physical signs remaining practically unaltered. Remissions are common. Four of the cases had been under observation for more than ten years.

Goldflam labels the condition myelitis funicularis unilateralis, and strongly advises against operation. In a patient of Oppenheim's, who died three weeks after an exploratory laminectomy, a lesion was found limited to the white matter of the cord on one side, consisting of several foci which had coalesced, involving the lateral and posterior columns, and spreading to the cerebellar tracts.

The differential diagnosis from tumour, which in the early stages may be very difficult, is discussed at length.

J. L. BIRLEY.

[31] Spinal tumours: statistics in a series of 330 collected cases.—

C. R. STEINKE. *Jour. Nerv. and Ment. Dis.*, 1918, xlvii, 418.

FORTY varieties in the structure of spinal tumours have been recorded. As regards their location, it is possible to divide them into four groups: (1) Vertebral (primary and secondary); (2) Extramedullary (intradural and extradural); (3) Intramedullary; and (4) Caudal.

EARLY SYMPTOMS.—

1. Vertebral group: Due to pressure on nerve roots and the cord. Pain is frequent, is persistent in character, and is often girdle in type. Local tenderness and rigidity of the spine may be present.

2. Extramedullary group: Here the nature of the pain depends on the site of the tumour. If on the posterior surface of the cord, pain in the back results. If on the nerve roots, the pain follows a typical root distribution. If the growth is near the anterior aspect of the cord, muscle palsies and cramps result.

3. Intramedullary group: Numbness and tingling in one or more extremities, followed by motor disturbances.

Tumours of lumbar region produce early sphincter troubles. Those in the upper cervical region cause respiratory disturbance.

Starr gives the sequence of the symptoms, as they arise in spinal-cord tumours, in the following order: (a) Peculiar pains with a limited distribution; (b) Increase of reflexes below the lesion; (c) Paraplegia; (d) Sensory loss; (e) Loss of all subjacent reflexes.

TREATMENT.—Gumma being excluded from the diagnosis, removal by operation is indicated. For the severe pain in inoperable malignant disease of the spine, the posterior spinal roots may be divided, or—and this gives more lasting benefit—the anterolateral columns of the cord may be cut.

Extradural tumours are removable, with a mortality of 33 per cent; intradural present more difficulty, but the mortality is no more than 35 per cent. Caudal tumours, on account of the involvement of the roots of the cauda equina, also present great difficulty. The mortality is 46 per cent. Intramedullary tumours are very satisfactorily dealt with by the two-stage operation. In the first stage the tumour is exposed only, and then at a later date removal takes place. (Horsley and Elsberg both had a nil mortality in dealing with these tumours.)

PATHOLOGICAL TYPES IN 330 SPINAL TUMOURS, WITH THEIR RELATIVE FREQUENCY.—

1. Vertebral group: Primary growths (mostly sarcomata), 13·6 per cent. Secondary growths (especially carcinomata mammae), 4 per cent.

2. Extradural group: (a) Extradural (mostly fibromata and sarcomata), 16·6 per cent. (b) Intradural from pia arachnoid (mostly fibromata, endotheliomata, psammomata, and sarcomata), 29·4 per cent.

3. Intramedullary group (mostly gliomata, gliosarcomata), 11 per cent.

4. Caudal group (mostly endotheliomata, fibromata, and sarcomata), 9·1 per cent.

Location unstated in 16·3 per cent.

Tables are given illustrating further analyses of the cases. In the recoverable cases, the author lays stress on the necessity for early and careful operation, followed by efficient post-operative treatment.

W. JOHNSON.

## TREATMENT.

[32] Treatment of causalgia. LEWIS and GATEWOOD. *Jour. Amer. Med. Assoc.*, 1920, lxxiv, 1.

Four cases are described as occurring in 550 peripheral nerve injuries. Of these four, three were operated upon and injected with 60 per cent alcohol, being cured after a previous simple neurolysis had failed to abolish the symptoms. The remaining case was under observation at the time of writing. Only one was observed as long as four months, and in this there was no return of the causalgia. No gross changes in the nerves were observed except superficial adhesions. The cases all occurred in the median, except one which affected the internal popliteal division of the sciatic nerve.

J. LE FLEMING BURROW.

- [33] The medical treatment of Graves' disease, with special reference to the use of corpus luteum extract.—H. A. HOPE. *Jour. Nerv. and Ment. Dis.*, 1918, xlvii, 254.

THE author begins his article with a review of the present-day knowledge of the corpus luteum. Its structure is glandular, being formed of epithelial cells derived from the membrana granulosa of the Graafian follicle. These cells supply an internal secretion, which is poured into the neighbouring blood-vessels and exerts an important influence in preserving the normal course of menstruation and pregnancy. Further, it exerts a decided influence on the mammary glands and the metabolism of secondary sexual characters. The internal secretion is to be regarded as the active agent of the sex glands represented by the interstitial cells in the male and the corpus luteum in the female. Its tendency is to promote assimilation and retard metabolic activity—an action which is directly opposed to that of the thyroid secretion, which accelerates metabolism and increases excitability. Thus, these two structures, the interstitial sex glands and the thyroid gland, possess directly antagonistic actions. Graves' disease, the author suggests, may be the result of undisputed thyroid sway, in conditions where the interstitial cells have ceased functioning adequately.

As a result of treating cases of Graves' disease with extract of corpus luteum, the author has become satisfied that marked improvement follows. This has been particularly noticeable with regard to the cardiovascular symptoms. The administration of the extract must be for an indefinite period.

W. JOHNSON.

- [34] Blepharo-contractures: treatment by local alcohol injections. (Blépharo-contractures, traitement par l'alcoolisation locale).—SICARD and POULARD. *Revue neurol.*, 1918, xxv, 24.

THE authors suggest that convulsive movements of the eyelids may be classified into three groups: (1) Blepharo-tics: these have a purely tic origin (i.e., have originated as a voluntary movement) and are frequently part of a wider habit-spasm movement (face, neck, etc.). (2) Blepharo-spasms: in this type, the convulsive movement is limited to certain definite groups of muscles. One or other, or even all, of the branches of the facial nerve distribution may be involved. These are characterized by the fact that, once the spasm has begun, no amount of voluntary effort can control the movement (as is possible with a tic). An organic cause underlies this form. (3) Blepharo-contractures: here the condition is analogous to the local contractures which are seen in hands and feet, and like them follows on some slight local trauma. Thus it is generally unilateral. The muscles are in a continuous state of contracture, and there is no periodic return to the normal as in cases of spasm. Active resistance is encountered in attempting to raise the closed lid, and the patient complains of pain when this is done. The treatment of this third group presents considerable difficulty. Psychotherapeutic measures proving unsuccessful, the authors decided on producing a complete inability to close the affected eye by paralyzing the superior branch of the facial nerve. This was effected by

means of injecting a few drops of alcohol into the superior branch where it crosses the ascending ramus of the inferior maxilla—in which position it is separated from the inferior branch of the facial nerve, which therefore remains undamaged by the injection. The paralysis lasts some weeks, and, during recovery, active re-education is carried out with the object of re-establishing the patient's normal control.

W. JOHNSON.

- [35] **Post-herpetic pain and its surgical treatment** (Algies post-zostériennes et leur traitement chirurgical). —J. A. SICARD. *La Médecine*, 1920, i, 278.

PAIN after herpes is relatively frequent; it is most severe in the trigeminal area, less on the trunk, and least on the limbs. Age is the most important factor; pain is never present under 30, but even in old age it may be absent. Many cases of post-herpetic neuralgia recover, but if the pain lasts more than a few months it is almost certain to persist. Applications to the skin, and injections into the nerves concerned, fail to cure.

Various operations have been described, such as removing the posterior-root ganglia, or dividing the posterior roots between the ganglia and the cord, and at the same time destroying the sympathetic fibres. The fibres to four segments should be divided. The author and Desmarest cut the anterior and posterior roots of four segments in the epidural space between the dura and a ganglia, and in a second stage avulse the ganglia. This was done in 7 cases, with 3 cures, 2 failures, and 2 deaths. The reason for failure after a correct operation is not known. Perhaps the pain arises from cells of the posterior horn which were affected by the original inflammatory process.

W. J. ADIE.

## Psychopathology.

### PSYCHONEUROSES AND PSYCHOSES.

- [36] **Psychoses associated with influenza** (Psychosen nach Grippe). —K. HITZENBERGER. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 267.

OBSERVATIONS on psychoses associated with the influenza epidemic of 1918. The material is divided into two groups: (1) Cases in which influenza was the direct cause of the psychosis—fever-delirium and post-febrile amentia; (2) Cases in which the toxic condition aroused a latent tendency to mental disorder.

Naturally only the severest cases of delirium came under treatment in the clinic, and 15 are included in this study. The symptoms were confusion, terror, psychomotor excitement, and delusions of persecution and poisoning associated with hallucinations. The majority of cases were men; the earliest onset was the second day of fever, and the latest the eighth; the prognosis in respect to life was bad, 12 cases ending fatally, whilst the mental symptoms subsided with the fall of the temperature in



the 3 cases which recovered. Post-febrile cases numbered 30, the greater proportion of whom were women. The symptoms were association disturbances, confusion, and hallucinations, and the psychosis began with sleeplessness, fatigue, irritability, and nocturnal hallucinations, some cases of short duration remaining at this stage. The prognosis was good, and no case ended fatally. The interval between the fall of temperature and the onset of mental symptoms varied from two to fourteen days. In no case was the influenza the sole factor in the production of the post-febrile psychoses. An hereditary factor could be excluded, but lactation, pregnancy, alcohol, or malnutrition appeared as subsidiary causes. In view of the relatively small number of psychoses in a widespread epidemic, the writer concludes that there must be an unknown causal factor in these cases.

The second group includes cases of melancholia, mania, dementia præcox, and delirium tremens, and in these cases the influenza is to be regarded as the immediate influence which brought the latent psychosis to the surface.

## H. DEVINE.

[37] **An acute prison neurosis of the anxiety type.**—YAWGER, *Jour. Nerv. and Ment. Dis.*, 1919, 1, 319.

THE writer describes an anxiety neurosis in prisoners which, he believes, he is the first to consider seriously. The condition was noticed during the period elapsing between an application for pardon, or a release on parole, and the final decision in the matter. Nervous tension increased towards the end of this period, and some of the cases became so ill that they had to be removed to hospital. Various factors in the cases are considered as causes, and a detailed list of symptoms is given. Without exception the cases all recovered immediately their applications had been dealt with. An adverse decision on the part of the authorities had as beneficial effect on the condition under consideration as a favourable one. A strong factor in all cases seemed to be the uncertainty of their future on entering the world again.

## R. DANSIE.

[38] **The psychic sequelæ in head-wound and commotional cases.**  
(Les séquelles psychiques des blessés du crâne et des commotionnés).  
—FRANÇAIS AND BESSIERE, *Revue neurol.*, 1918, xxv, 305.

THE authors here present a mental syndrome which they have found common to cases of head injury and of commotion. In cases of head injury no correlation was established between the seat or the severity of the bony lesions and the nature and gravity of the symptoms. The same symptom-complex was observed in a number of purely commotional cases, and emotional features could not be isolated from the commotional syndrome.

After a detailed description of results obtained by the examination methods of Ballet and Genil-Perrin, the authors present the following conclusions: (1) There was complete amnesia for the period immediately following the trauma: (2) Diminution and rapid fatigue of sustained

attention, causing a difficulty of fixation more or less marked; (3) Slowness of the associative process, leading to difficulty of recollection of remote facts; (4) The affectivity of patients remained unimpaired, and their emotivity was greatly exaggerated; (5) The mood was one of general sadness and mental depression; (6) Judgement seemed unimpaired at the time, but it was feared it would become defective if the aforementioned troubles did not clear up; (7) Activity was sensible, orderly, and coherent, but slow; (8) Delusions and hallucinations were but seldom observed, and then only in the period immediately following the trauma and during the mental confusion which so often supervened—they were usually met with in persons of a very low mental type; (9) Other symptoms found were headache, vertigo, labyrinthine disorders, physical weakness, inertia, and inactivity.

There seemed to be an indication of a selective feebleness of memory, attention, and association.

R. DANSIE.

[39] **Schizophrenia in childhood** (Ueber Schizophrenie im Kindersalter).

—M. GRUNTHAL. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 206.

CHILDREN are not exempt from the various forms of mental disorder. Many are classified as mentally defective, but it is possible to distinguish between congenital defect psychoses and other forms of mental disorder in children. It is difficult to estimate the proportion of cases in children, since many are treated at home for 'nervousness', and others are placed in institutions for the feeble-minded. A further difficulty consists in the fact that no sharp line can be drawn between childhood and puberty, and each case must be taken on its merits, and an examination as to the presence of secondary sexual characteristics undertaken in every instance. Furthermore, as in adults, it is often extremely difficult to estimate the boundary between normal and morbid, and especially is it hard to distinguish between a mild schizophrenic condition in childhood and the gradual onset of a psychosis developing in later life.

After a short survey of the literature, the writer describes six cases of dementia præcox in children from 12 to 14 years old. With one exception the onset was sudden, and in each instance the mental development had been normal, the general health good, and nothing noteworthy was found in the history. Secondary sexual characteristics were absent. One case might be attributed to vaccination, another to change of environment, and others to doubtful psychic trauma. The symptoms were characteristic of dementia præcox. Some of the cases were not sufficiently long under observation to determine the ultimate outcome, and though opinions on this point show an apparent variation, the difference chiefly consists in what is meant by the term 'recovery'. Another case described appeared to be associated with the first menstruation, and reference is made to the fact that it is difficult to exclude puberty as a factor in these cases, since premature sexual development may exist without the associated bodily changes. In this case, and others described later, the psychosis was engrafted upon an already existing abnormality of make-up, a condition

which many observers have noted in cases developing later in life. In some of the cases the onset was associated with a severe anxiety state, suggesting the possibility that a previous sexual trauma had determined in a measure the character of the symptoms. One case might have been associated with organic brain changes, as there was a history of hydrocephalus and convulsions in early childhood. In other cases described there was evidence of definite mental defect preceding the acute illness, and the writer introduces the question of the significance of the conditions described under the terms *dementia praeocissima* and *dementia infantilis*, and he refers to the suggestion of Kraepelin that some idiots are actually cases of *dementia praecox* occurring in early life. He points out that all these questions in respect to engrafted hebephrenia can only be solved by an explanation as to the cause of *dementia praecox*; but he suggests that a study of cases in imbecile asylums will probably afford valuable material in relation to the subject.

H. DEVINE.

## PSYCHOLOGY AND PSYCHOPATHOLOGY.

- [10] The generation and control of emotion.—A. CARVER. *Brit. Jour. Psychol.*, 1919, x, 51.

It is agreed that emotion arises in conjunction with instinctive processes, but it has never been satisfactorily defined, for emotion is only part of an internal adjustment to environmental reaction. The 'interest' of an instinct is the affective tone which accompanies the instinctive process when carried through satisfactorily, and emotion is the subjective experience which develops when instinct is checked by higher control. The relation between reflex action and instinct is dealt with, and it is seen that the more instinctive reactions are fixed, the less the manifestation of emotion. It is the infinite variety of possible responses that is correlated with a maximal disposition for the arousing of emotion. The function of emotion is to reinforce 'interest' and thus keep the object in the focus of attention.

The James-Lange hypothesis is shown to be untenable, and the experimental work of Goltz and Cannon, and the clinical work of Head and Holmes, is quoted to reach the conclusion that the visceral and somatic concomitants of emotion are only anticipatory physical adjustments which enable the organism to put forth all its energy effectively to satisfy the stimulated instinct. Integration can occur at all afferent functional levels of the nervous system, and there is much evidence that functional dissociation may also take place at any level. Neuroses arise through functional dissociation from loss of higher control and emotional causes. In warfare the pent-up emotion seeks some outlet, and if this is denied, the individual tries to escape by avoidance of the stimulus. This is repression. An outlet at the psychic level produces a phobia (or some analogous symptom) or general anxiety. The somatic outlet manifests itself as 'conversion hysteria'. The anxiety states arise at a higher mental level than the latter condition. Both are the result of a compromise between primitive instinctive impulses and higher-level control which blocks their path.

Babinski's theory of the so-called reflex neuroses is criticized unfavourably, and the author regards the visceral and sympathetic symptoms met with in some psychoneuroses as indicating dissociation at a lower functional level. Some of the obscure disorders arising from violent and prolonged emotion are probably due to the result of excessive outpouring of chemical excitants (endocrine secretions) where no opportunity for their use is given.

Sublimation is then discussed, and it is pointed out that if for any reason the resistance of the new path becomes too high, the energy reverts to a more primitive channel, a regression which is a constant feature in the neuroses.

C. STANFORD READ.

[41] A psychological study of some alcoholics.—L. P. CLARKE. *Psycho-analytic Rev.*, 1919, vi, No. 3, July.

ALCOHOL may serve as a paralyzant to the repressing forces of social customs and make an otherwise difficult social grouping free and natural. It may furnish an extended pleasure wand to reach a goal or state of rapport not tangible to the foreshortened grasp of an individual who lacks the capacity to create a proper degree of self-produced pleasure; or it may make easy for free egress the deeper and imperfectly adjusted unconscious motives.

The author sees a probable increase in neuroses and psychoses through legal prohibition, and points out that, instead, the underlying defects that render alcohol a seeming menace should be attacked. Man freely rationalizes with regard to his drinking impulses, the real roots of which lie in the unconscious. The fear and restlessness which introduce dipsomaniac attacks are rooted in sexual conflicts. The certain animals seen by the alcoholic deliriant confirm this, and point to a homosexual complex having close relationship to alcoholism, the effect of the alcohol being destructive of sublimations. This is well seen in the hallucinations of many persecutory states. Unconscious homosexuality is shown by Freud to be responsible for psychotic delusions of jealousy; this, however, is only one factor in the alcoholic psyche. Atavistic reminiscences play a large rôle in alcoholic psychology. The slumbering desire to dominate and tyrannize over woman is aided by alcohol. By numbing of the higher functions, the sadistic component of our nature tends to have freer play, and alcohol permits hidden criminal desires to work out. Many crimes seem to be the discharge of the need of a 'howling drunk'. The amnesic conditions met with may partly mean the desire to forget, the wish to break the chain of personal continuity, and thus the desire to transcend the ego. Another expression of this desire is suicide, which also may be used as a self-punishment. Solitary drinking agrees well with the libido trend of auto-erotism and mother-fixation. Repeated alcoholic desire may be also attributable to the erogenous nature of the mouth. The love potions of mythology were doubtless alcoholic in origin. Prowess as a drinker bespeaks prowess in sex, and man relies on alcohol because it gives him a feeling of manliness. Many alcoholics illustrate deeper and deeper regressions as they approach profound narcosis—so that one and the same case may show homosexual, narcissistic, and primary maternal identifications as the deeper fixations



are brought to the surface. Some agent like alcohol is so universally used because of the common defect and imperfection of our psychosexual life, and its improper or inadequate sublimation.

The confirmed alcoholic is by far a less favourable object for psycho-analytic treatment than almost any other neurotic.

C. STANFORD READ.

[12] Colour symbolism.—A. B. EVARTS. *Psycho-analytic Rev.*, 1919, vi, 124.

This study in the emotional values of colours was undertaken through a patient of the author's who exhibited well-marked colour symbolism in weaving some lace in which she illustrated the story of her mental conflicts. She explained her various choice of colours, and in her symbolism there was much that was determined by her experience, and much that she had absorbed from the current symbolism about us all. The presence of colour is universal, and has crept much into our language. We lead a dull, grey life; sit in a brown study; see red when angry; tell white lies, etc. Colours have become symbols of well-nigh every emotion and aspiration. The various colours are then considered separately, and dealt with both historically and geographically. There are so many roots to the symbolism for colour that it appears that any colour might symbolize anything, and yet if carefully studied it will be seen that fairly well-marked lines are taken by the symbolism. Briefly, white is the colour of the God-head, of purity, of unity, of immortality; black is the colour of sin; red, that of passion and the creative force; blue, of coldness, passivity, truth; green, of activity, or active reproduction; yellow, of religious aspiration and beneficence; purple, of controlled passion.

Attention is drawn to the constant crossing of the lines of colour symbolism with symbolism of other things, and the language of gems, metals, and flowers is referred to. The red rose is the flower of love; white flowers indicate purity and chastity; violets are modest, and "pansies for thought". The symbolism of numbers is also connected with colour symbolism. Much of the symbolism of colour from the ancient religions was assimilated by the early Christian church, and has become more or less fixed. There seems a deep connection between colour and music. The author has been told that the key of E is generally considered among musicians to represent purity, and is often spoken of as the white key, while the harsh key of F is brown. The keys of A flat and D flat are crimson and purple because they are so full, deep, and rich, and the key of G is mild and not so very decided, and is thought of as blue. In conclusion, the national flags are dealt with, and it is pointed out that red, white, and blue have been chosen by the greater portion of the earth as the fitting representatives of the national spirit; white, the colour of the great God in all His attributes; red, the colour of the great life-giving force; and blue, the colour of the great passive force. It has been proved that in colour the early worship of the human race found symbolic expression, the symbolism of which has lived through the centuries.

C. STANFORD READ.



- [43] The foster-child fantasy.—EDMUND S. CONKLIN. *Amer. Jour. Psychol.*, 1920, Jan.

THIS article sets out to discuss the statement so often made by psychoanalysts, "that all or nearly all children conceive the notion that they are the children of much greater parenthood", their real parents being their foster-parents. The psycho-analytic conclusion has been based on the study of patients suffering from various forms of neurosis. This inquiry supplements their obviously defective material by making use of the *questionnaire* amongst intelligent healthy young adults between the ages of 14 and 25, and over. The main questions were, "Did you ever have the experience of day-dreaming or believing that you were an adopted or foster-child, and that your supposed parents were not your real parents?" "Was it merely a day-dream, or did you believe it to be true?" In the reply to the main question, out of 904 replies, 258, or 28 per cent, were in the affirmative, and 646 were negative. In reply to the second question, out of the 258, those who held the belief to be real were 71 (25 per cent), those who confessed it was a day-dream 159, and those in whom the idea was but a casual thought 27. As to the form of the fantasy, 54 per cent had no clear concept, 15 per cent thought they were orphans or foundlings, and 18 per cent thought they were children of great parentage. As to the causes offered for the fantasy, nearly half were due to suggestion (from books, etc.), and a quarter to mistreatment, actual or supposed. Further questions as to the effects of the fantasy upon conduct, duration of the fantasy, and the age and cause of its disappearance, are also dealt with. These results are compared, and found to confirm the results of psycho-analysis, especially as to the frequency of the belief, in that as many as 28 per cent immediately recalled the memory of the fantasy, while many others must have had it in childhood, but forgotten it owing to psycho-neurotic suppression or other cause.

J. A. HADFIELD.

- [44] What is 'the unconscious'?—H. J. MULFORD. *Amer. Jour. Psychol.*, 1919, xxx, 253.

THIS article discusses the physiological basis of the conception of 'the unconscious', the use of which term merely serves to increase the mystery surrounding mental processes. Of the three phases of nerve-cell activity—action, reaction, and interaction—the second, reaction, is the most important and the least understood, since it occurs within the cell itself. It is this 'reaction' phase which it is attempted to explain by the unsatisfactory word 'unconscious'.

Does the cell (e.g., the amoeba) know what it is doing? "If by consciousness is meant 'self direction', we must deny consciousness to the cell; but if by consciousness is meant merely the ability to react to external stimuli, then the cell does possess it". The cell has not the power to consider, it has only the power to respond—it has not *conscious consciousness*, but *reflex consciousness*. But when the cell is withdrawn into the brain, and is in touch with the outside world only through the axon, it takes on the higher function, and not only does what it is told,

but *it knows what to do*. The same primitive apparatus is thus used for two different processes, and the cell responds in two ways: one a quick unconsidered response to external stimulus, the other a slow response in which the reply is *considered*. The trouble arises when the cell should respond in this considered way, but fails to do so, and the response is of the more primitive reflex type, and, passing through quickly and aimlessly, is without real value to the mind. It is thought, but not conscious thought: merely reflex thought. So we see in the 'unconscious' merely such reflex thought. It is action, reaction, and interaction outside of the consciousness of the individual. It is not unconscious action, but it is reflex consciousness. Consciousness is always present somewhere wherever there is action. Any cell that responds to a stimulus must be conscious during that response. The individual is not always conscious of the actions of his own mind, but it is his mind that is acting, and mind is consciousness. "It is then not so difficult to understand the disorders of the mind". The response to stimuli is conscious, but the result depends on whether the conscious is reflex consciousness or conscious consciousness. If it be conscious, well and good; if it be reflex, it may be neither well nor good.

J. A. HADFIELD.

[15] **Sleep-walking and moon-walking.**—J. SADGER. Translated by L. BRINK. *Psycho-analytic Rev.*, 1919, vi, Nos. 2, 3, and 4; vii, No. 1 (and continued).

LITTLE scientific literature exists on this subject, so that Sadger's study is the more welcome. Noctambulism is preferred to the term somnambulism, as the latter denotes too much. The influence of the moon proves a highly interesting study. It is asserted that a specially deep sleep always ushers in the wandering, it is more frequent with children up to puberty, and the first outbreak often occurs at the first appearance of sexual maturity. The condition must be considered as pathological, symptomatically similar to hysterical and hypnotic somnambulism. The questions to be specially solved are, first, why does not the sleep-walker sleep quietly, working out his unconscious complexes in a dream, even though with some speech and movement? Why is he urged to wander and perform complicated acts? In the second place, what value must be attributed to the moon and its light? Sadger endeavours to answer these propositions from the psycho-analysis of victims to this abnormality, and gives the history and analyses of these cases at some length. He finds a special organic disposition which is absent from no sleep-walker—a heightened motor stimulability. There is also a special disposition to sleep-walking in the descendants of alcoholics and epileptics: in individuals with a distinctively sadistic character: and, finally, in hysterics whose motor activity is strongly affected, and who also suffer with convulsions, tremor, paralysis, or contractures. An abnormal increase of muscle eroticism was in evidence. The question of the influence of the moon on the sleeper is more difficult to answer. There may be many individual psychical determinants, mainly connected with the moon, arousing by association early infantile pleasure memories. Among other things the mother's lamp or candle when visiting the child

at night, and the thought that the moon everywhere lighted the way which led to the dwelling of earliest childhood : both of which would signify desire for the mother's love, a parent complex being common. There is an infantile comparison of the moon's disc with the childish nates, and often there is not wanting a gross sensual relationship. Sadger goes so far as to deem it possible that some 'magnetic' influence may also exist.

Confirmation of the author's findings are given in three autobiographical literary reports, the first being of the famous physiologist Burdach, who had occasional attacks of moon-walking from his tenth to his thirtieth year. In a literary section, Sadger brings to his aid in the solution of the problem before him the analysis of the creation of poets and authors. Herein he finds again substantiation of his earlier conclusions.

Sexual impulses are stated to be the foundation of moon-walking, desire for sexual gratification (infantile), and one apparently acts in sleep in order to escape all culpability, while the unconscious still knows about it. The sleep-walking begins with the sexual basic motive at the time of puberty, and lasts until it is inhibited by the close of that period, or in woman with the birth of the first child. At the beginning, the bed of earlier sexual pleasures—the bed of childhood—is sought ; later, the bed of the loved object who has taken the place of the originally loved object, the parent. The heavenly body effects a sexual excitement not only through its light, but also through sexual phantasies which are bound up with it.

C. STANFORD READ.

[46] **The tonus of autonomic segments as causes of abnormal behaviour.**

—KEMPF. *Jour. Nerv. and Ment. Dis.*, 1920, li, 1.

AN attempt to explain the cause of abnormal behaviour as the activity of the autonomic system in endeavouring to obtain control of the voluntary muscular system, and through that of its environment. Emotional reaction is shown to be the result of postural tensions of one or more autonomic segments. Consciousness is made up of this enteroceptive sensory stream and the kinæsthetic stream of sensation resulting from the activity of the voluntary muscles. Hallucinations or delusions are varied kinæsthetic streams, aroused by an ungratifiable autonomic craving. The autonomic reflex is shown to be conditioned continuously by social obligation and experience. Through the struggle of the various segments for control of the final common motor paths we get a compensatory development of the ego.

After tracing the development of the ego from the congenital activity of the autonomic apparatus at birth through the various conditioning influences which ultimately develop the social features of the personality, the author passes to a consideration of suppression and repression. He gives the following formula :—

$$\frac{\text{Manifest primary wishes} + \text{subsidiary wishes (ego)}}{\text{Repressed primary wishes} + \text{subsidiary wishes (non ego)}} \times \text{environment} = \text{behaviour};$$

and points out that most psychopathic personalities suffer from auto-

affective cravings which are either unjustifiable or ingratiating, and which lead either to desperate repression or social regression and indulgence.

Various types of neuroses are described, and many cases quoted, which illustrate the different methods of struggling with and adjusting jeopardizing cravings so as to prevent a 'fear state' of the autonomic apparatus. The author groups psychotherapeutic principles into two general systems: (1) Suggestion method; (2) Psycho-analytic method; and advocates a sensible use of the reconstructive suggestion method following the psycho-analytic readjustment.

The article is far too extensive to be abstracted in any detail, but it is very suggestive and stimulating.

R. DANSIE.

### TREATMENT.

[47] Contributions to psychotherapeutic technic through psycho-analysis.—S. E. JELLIFFE. *Psycho-analytic Rev.*, 1919, vi, 1.

SOME of the light which Freud has turned upon mental problems, and upon which he bases his therapy, is here briefly described. Ferenczi has shown that the production of the hypnotic state depends upon transference, and that the apparent suggestion introduced is only the spontaneous upspringing of impulses and ideas already present in the unconscious. Suggestibility, then, whether in the unconscious or conscious state, is the readiness to pour out unconscious previously-inhibited content because of the transference factor. Advances in therapy lie rather in setting free from within tendencies already there, than in the introduction of new ideas from without. To impose occupation and amusement from without is to invite failure; but to allow the patient to use old paths of interest and find them leading out through their very original value to constructive contact with environment, leading now outwardly, no longer only within, is in line with these natural advances. Wide employment of the means at hand in the world of real interests and mutual problems, is a most rational but too much neglected form of psychotherapy.

Special points in the technique of psycho-analysis in dementia præcox are brought forward. The difficulties of transference are great. The libido is bound in the accumulated affectivity which the original complex situation has gathered to itself, so that in many cases it is impossible to bring the affect to consciousness. The affect guards itself too jealously, and a special form of approach might be of great advantage. This is the establishment of a triangular transference, so that the affect is not put too strongly on the defensive, and too strong an erotic situation is thus avoided. In dementia præcox, therefore, transference may be accomplished not toward one person but two. The specially-trained nurse or attendant would allow of this distribution of interest. In minor mal-adjustments there is demand for some variations in the mode of approach. The sex of the analyst is often important, because of unconscious homosexual tendencies. The female paranoiac may often be better handled by a woman analyst, as well as the female compulsive neurotic, excitable, hysteric, and

manic patient. The analysis is then more likely to run more smoothly, a better emotional attitude is gained, and dangers in the first intensity of the transference when the free floating libido is seeking satisfaction is lessened. The sensitive, over-prudish woman patient is also saved from resistances and the likelihood of negative transference being set up.

C. STANFORD READ.

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# THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

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## Original Papers.

### A CONTRIBUTION TO THE HISTOPATHOLOGY OF CARBON-MONOXIDE POISONING.

By R. M. STEWART, PRESTWICH.

POISONING by carbon monoxide is of considerable practical importance in consequence of the greatly increased use of coal gas in modern industrial occupations. It is the cause of death in the vast majority of colliery disasters, and is often responsible for serious illness among iron and steel workers; nor can it be doubted that this agent may have much to do with the chronic ill health seen in laundry workers, cooks, factory hands, and, indeed, among all those employed in occupations where coal gas is used for power, heating, or cooking purposes.

Its symptoms are regarded by Haldane as being essentially those of want of oxygen, which is brought about by the displacement of the oxygen of oxyhæmoglobin by carbon monoxide, with the resulting formation of a more stable compound, carboxyhæmoglobin. According to his observations, carbon monoxide acts not so much as a poison, but as a physiological indifferent gas, apart from its one fatal property of uniting with hæmoglobin. In this way the blood is deprived of its oxygen-carrying power, a condition of anoxæmia is established, and serious or fatal damage inflicted on the tissues. There are, however, a number of workers who do not subscribe to this view, but affirm on the contrary that death is not so much the result of a diminished supply of oxygen as of a specific action of carbon monoxide on the nervous system. It has been pointed out that in carbon-

monoxide poisoning there is no dyspnoea as there is in ordinary asphyxiation, and in animals poisoned experimentally breathing proceeds in an almost normal manner (Gippert). The respiratory centre does not appear to respond to the want of oxygen by increase of respiration, from which it may be inferred that carbon monoxide has a specific action on the nerve centres. In the characteristic train of symptoms following the inhalation of carbon monoxide, or exposure to gases containing this compound, the most important are those relating to the functions of the nervous system. Headache, vomiting, impairment of the higher mental functions, of the special senses, and of voluntary motor power, may be frequently observed; in severe cases, where the saturation of carbon-monoxide exceeds fifty per cent, loss of consciousness and death usually occur. The remote effects seen in patients who survive are of a very varied character; but mental and nervous disorders are conspicuous in all, the former comprising varying degrees of dementia or amnesia, and the latter spastic paralysis or peripheral neuritis. Mott, who examined the brain of a woman who died after inhaling illuminating gas, observed enormous numbers of small capillary hæmorrhages throughout the white matter of the centrum ovale, in the corpus callosum, and, to a less extent, in the brain stem, various chromatolytic changes in nerve-cells, and widespread fatty degeneration of the endothelial cells of the smaller vessels. In this case pneumococcal toxæmia was also found, and it is possible that a pneumococcal toxæmia was associated with the cause of the hæmorrhages. Punctiform hæmorrhages have also been described by a number of other observers, but on the other hand they are sometimes absent; thus Davies reported that he was unable to observe any in the brain of a miner who succumbed to carbon-monoxide poisoning in the Senghenydd disaster of 1913. In the majority of fatal cases which have been the subject of pathological investigation, death has occurred within a period of four to seven days; to determine to what extent the neurone suffers permanent damage and, in general, how the nerve-fibres and their enclosing myelin sheaths react to the impoverished oxygen supply, it is necessary to examine material from cases in which the fatal issue has been delayed for several weeks.

The writer has been fortunate in having had the opportunity of examining tissue from every part of the cerebrospinal axis of a patient who died from the effects of gas poisoning on the twenty-fourth day of his illness. Histological examination revealed the presence of an intense and universal myelin degeneration, bilateral softening in the basal ganglia, and a widespread cortical softening, strictly confined to the deeper layers of the grey matter. Such a peculiarly situated

encephalomalacia has apparently not been hitherto described, and it is chiefly for this reason that the present contribution is made.

**Clinical History.**—W. A., male, engineer, age 55. Admitted to the County Asylum, Prestwich, Dec. 10, 1913, with a history that he had been restless and nervous for about one month, but had remained at work up to the day before his attempted suicide (Dec. 7). When 40 years old he had had Bright's disease, and was then depressed for a fortnight.

**ON ADMISSION.**—He was in a very debilitated state, with cyanosed lips, sordes on teeth, and obstinate constipation; temperature  $98.8^{\circ}$ , pulse-rate 96. Urine: sp. gr. 1030, acid; deposit of urates; traces of sugar and albumin. Nervous system: pupils slightly unequal; normal reaction to light. Knee-jerks exaggerated. Slight wasting of small muscles of left hand. Mental state: he lay passively in bed with eyes closed, made no reply to questions, and was fed with difficulty. During the succeeding four days he remained in the same condition of torpor, apparently quite oblivious to his surroundings. On Dec. 15 his temperature rose to  $100^{\circ}$ , and he became restless, occasionally throwing his arms about, and crying out suddenly. Lumbar puncture was performed on Dec. 20; a marked lymphocytosis and a positive Noguehi reaction were present. Two days later he appeared somewhat better, and made efforts to speak, but without success. Tendon reflexes were brisk; plantars normal; no sphincter control. There was now more distinct wasting of the thenar and hypothenar eminences of the left hand. Dec. 26, pulse became soft, compressible, and difficult to count, and wasting of the small muscles was now observed in both hands. Dec. 30—the day of his death—he lay with his head retracted and limbs flexed, moaning constantly. Temperature  $98^{\circ}$ , pulse 84, and respirations 32. Death at 6.45 p.m.

**Post-mortem Appearances.**—Autopsy thirty-nine hours after death; the weather was very cold, and the body was therefore in a good state of preservation.

There were no external changes of importance, and the blood was normal in appearance. Dura mater was normal, and pia arachnoid hyperæmic, diffusely thickened, and of milky colour. This thickening was evenly distributed over the whole convex surface, and also at the base. The brain weighed 1310 grms.; the convolution-pattern was complex, and there was no obvious cortical atrophy. Careful scrutiny of the cortex in section showed the presence of an almost continuous line, greyish-white in colour, situated nearer the deep than the external surface, and suggestive of a cortical softening remarkably sharply defined, but apparently universal in its distribution. In the white matter the only change noted was prominence of blood-vessels. There was an entire absence of punctiform hæmorrhages throughout the cerebrum; of ventricular dilatation; and of ependymal granulations. The globus pallidus contained a small but obvious softening, darker in colour than the surrounding tissue, which had a friable, pitted appearance. Situation, shape, and appearance of affected area corresponded exactly on the two sides. The large arteries at base were healthy. Spinal cord presented no naked-eye abnormality. Both kidneys much reduced in size, firm, and cirrhotic, with moderate degree of cortical atrophy. Other organs showed no noteworthy change.

**Microscopical Examination of the Nervous System.**—Preliminary fixation by formalin and alcohol; the cerebral gyri were examined in

every region of both hemispheres, and in addition sections were made from basal ganglia, cerebellum, red nucleus, brain stem, and spinal cord. Certain cranial nerves were examined. For the preparation of the sections I am indebted to Mr. H. Wisken, late laboratory assistant.

*The Cerebral Cortex. The Pia Arachnoid.*—The meshes of the pia contain congested blood-vessels, in some of which the red blood-corpuscles show a basophil reaction: partial or complete hyaline thrombosis has occurred in many places. The cells of the pial connective-tissues have undergone moderate proliferation, and adventitial infiltration may be seen in certain situations. Plasma-cells, fibroblasts, polyblasts, and rod-cells can be identified: no polymorphonuclear leucocytes or mast-cells are present.

*The Area of Softening.*—A close examination of vertical sections of the unstained cerebral cortex with a lens, or even with the naked eye, shows the presence of a narrow stratum, greyish-white in colour, in the deeper part of the grey matter. It is present throughout the whole cerebral cortex, and both hemispheres participate to an equal extent. With a low power it is at

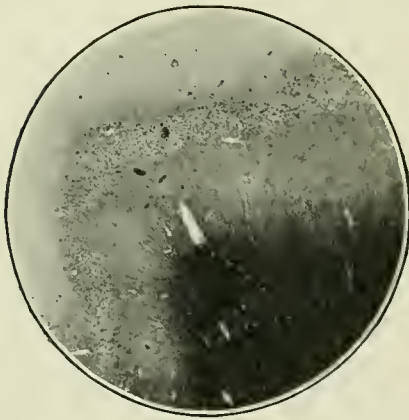


FIG. 1.—Cortex. Right ascending frontal gyrus, showing the zone of softening in the infragranular layers. Frozen section stained with scharlach-R.

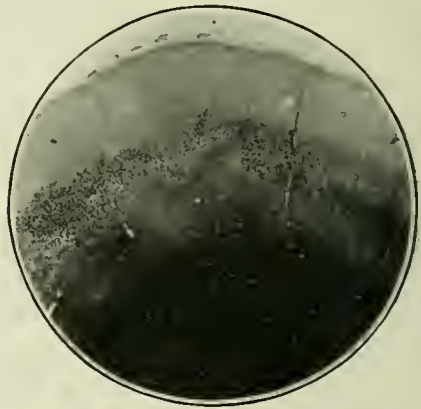


FIG. 2.—Cortex. Right first temporal gyrus, showing similar appearances. Frozen section stained with scharlach-R.

once obvious that in every area of the cortex there exists a zone of softening, and further, that without exception this occurs only in the deeper or infragranular layers of the grey matter. (Figs. 1, 2.) It can be followed over wide areas as a continuous unbroken line, showing little or no variation in its contours. In some situations, however, it is interrupted, giving an appearance of multiple foci of softening, with narrow tracts of unsoftened grey matter isolating these areas one from the other. The usual site of this morbid process is in the third and fourth cortical layers (Brodman's nomenclature), as in nearly every situation a narrow zone of more normal grey matter separates it from the medullary substance.

The appearance of a frozen section stained with scharlach-R is very striking: the brilliantly-stained orange-red fatty droplets crowded together in the area of necrosis form a conspicuous band of colour, contrasting with the paler and more normal tissue above and below it. The necrotic character is clearly indicated by the presence in it of a great increase of stainable



fat. (Figs. 3, 4.) With Nile-blue sulphate-A the fat-globules stain deep blue, no red-stained fat being seen. The application of Marchi's method gives the appearance of brownish-yellow globules, intensely black droplets being rarely seen.

It is important to observe that the process of softening is a partial one : the picture is not that of an area in which all structural form is lost ; disintegrating lipid substance is present in great abundance, but the process has not gone on to complete autolysis. The necrosed tissue stains rather diffusely with acid dyes. In it one can observe a partial disappearance of the more highly differentiated elements—the ganglion cells—sparing the neuroglia and vessels in such a way that the architecture of the area is to some extent preserved. Here and there ghost-cell outlines are visible, and the majority of surviving nerve-cells have suffered great distortion in shape and position ; their processes have also disappeared. Axis-cylinders can be traced from the white matter through the lowest cortical layer to the zone of softening, where they abruptly disappear. In this way



FIG. 3. —Cortex. Left ascending parietal gyrus : frozen section stained scharlach-R, showing stainable fat in intracortical zone of necrosis.



FIG. 4. —Cortex. Left ascending parietal gyrus, showing under a higher magnification the fatty droplets. The white matter is below. Frozen section stained with scharlach-R.

the lower boundary of the area is clearly defined. Both above and below it are nerve-cells preserving to a certain extent their normal columnar arrangement ; they are in all stages of subacute decay, and in many instances surrounded by satellite cells.

The neuroglia tissue shows an active cellular proliferation ; numerous cells having the morphological appearance of *Stäbchenzellen* are present, and others, resembling fibroblasts, occur in great numbers. At the edges of the softened area there is no dense zone of cellular proliferation such as one is accustomed to see at the margins of a small cerebral softening.

There is an appearance of increased vascularity owing to the formation of new capillary vessels, which can be seen sprouting in every direction. Many small vessels show adventitial proliferation, and contain hyaline thrombi ; on the other hand, in many situations the vessels contain unaltered and discrete red blood-corpuscles.

In the regions of the cortex, above and below the zone of softening,



both parenchymatous and interstitial changes are found. The surface neuroglia layer is slightly thicker than normal, and elsewhere there is a marked increase in neuroglia-cells. Congested vessels frequently filled with hyaline thrombi are found, and the Virchow-Robin spaces are filled with small round cells; plasma-cells occur in small numbers.

*The White Matter.*—There is widespread degeneration of the myelin sheaths of nerve-fibres, enormous numbers of fine black droplets being scattered throughout the medullary substance; they are particularly abundant in the neighbourhood of vessel-walls. The axis-cylinders exhibit various morbid changes: frequently they stain intensely with hæmatoxylin and eosin. The neuroglia-cells are increased in numbers, and the vessels are dilated and often filled with hyaline thrombi. Careful search does not reveal the presence of free hæmorrhages or foci of softening.

*The Basal Ganglia.*—The globus pallidus is filled with very numerous *Körnchenzellen* (Fig. 5); in the putamen they are less numerous, and tend to occur in groups, often in the neighbourhood of vessels. The internuncial

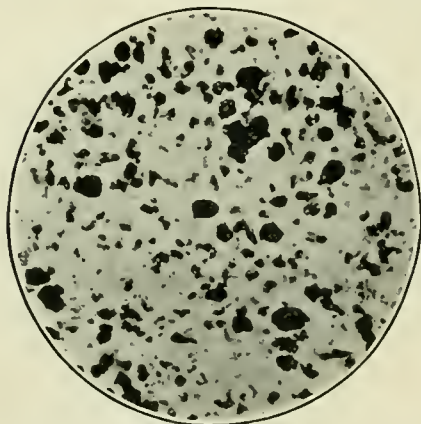


FIG. 5.—Körnchenzellen in right globus pallidus. Marchi's stain.



FIG. 6.—Longitudinal section of the right vagus nerve, showing intense Marchi reaction. Marchi's stain.

fibres and those traversing the nuclei stain an intense black. Many of the larger blood-vessels are filled with red blood-corpuscles and partly-formed thrombi; others show little or no deviation from the normal. The neuroglia nuclei are greatly increased in number, and the nerve-cells are profoundly affected: many have disappeared, and others are in advanced stages of decay.

*Basal Perforating Arteries.*—There is a certain amount of adventitial proliferation and cellular infiltration; some vessels can be found filled with thrombosed red blood-corpuscles.

*The Optic Thalamus.*—No hæmorrhages or areas of softening can be found, but hyaline thrombosis occurs with great frequency in the larger vessels. Marchi preparations show fine black granules throughout its substance.

*The Cranial Nerves. Optic.*—Sections from Marchi preparations show a diffuse distribution of fine blackened globules of altered myelin: the appearance is very similar to that seen in the medullary substance of the

cerebral hemispheres. *Facial*.—There is much more evidence of myelin degeneration, the blackened granules being numerous and of large size. *Vagus*.—In comparison with the other cranial nerves the vagus shows an intense myelin degeneration; hardly a fibre has escaped, the section staining almost uniformly black. (*Fig. 6*.)

*The Cerebellum. Cortex*.—The pial vessels are congested, and many are surrounded by small round cells. Immediately beneath the pia mater are large numbers of colloid bodies. Hyaline thrombosis is present, but no hæmorrhages or areas of softening are visible. The Purkinje cells show pronounced chromatolytic changes, the majority appearing pale, homogeneous, and without Nissl bodies. Marchi sections show considerable myelin degeneration, uneven in its distribution.

*Central Nuclei*.—There is marked myelin degeneration in the neighbourhood of the nucleus dentatus; the nerve-cells are heavily pigmented, and show various stages of chromatolysis.

*The Red Nucleus*.—In the upper part of the midbrain there is a widespread myelin degeneration, which is particularly marked in the fibres of the third nerve as they traverse the nucleus ruber. The smaller nerve-cells of the nucleus show diffuse staining and a disappearance of chromatolytic substance.

*Pons Varolii and Medulla Oblongata*.—There is a diffuse and intense Marchi reaction, which is particularly well seen in the pyramids, in the solitary bundles, and in the cranial nerves in their intramedullary course. The nerve-cells are for the most part abnormal; the cell body is usually swollen, and shows a degeneration of the stainable substance into dust-like particles in the neighbourhood of the nucleus, which is usually dislocated to one side. The changes in the vagal nuclei do not appear to be more pronounced than those in other situations.

*The Spinal Cord. Nerve-cells*.—The ganglion cells show a fairly advanced chromatolysis—for the most part perinuclear. It is more especially the large nerve-cells that are affected; indeed, many have completely disappeared. Others are reduced to amorphous granular masses, invaded by glia-cells. In sections from the first dorsal segment (corresponding to the intrinsic muscle-groups of the hand) it is obvious that the cells of the anteromesial and posteromesial groups have undergone a marked diminution in numbers. Even more striking in this region is the wasting and shrinkage of the left anterior horn, which is paler than its fellow on the opposite side. This asymmetry of the ventral horns is seen in no other segment.

*Nerve Fibres*.—In Marchi sections, scattered through the white matter, are large numbers of fine blackened granules. They are particularly abundant in the root-entry zone, in the neighbourhood of the posteromesial septum, and in the marginal tracts. In the dorsal cord the fine dust-like particles are somewhat less numerous, and in the lumbar region this diminution is quite obvious.

*Reich Corpuscles*.—In the posterior columns of the cord, and to a less extent in the situation of the ventrolateral tracts, are large numbers of lilac-red granules: they are displayed in alcohol-fixed toluidin-blue and hæmatoxylin-eosin sections, appear to be lying free in the tissue spaces, and present no particular relationship to the vessels; in longitudinal sections they tend to be arranged in rows in the long axis of the cord, as though they were occupying the position of the degenerated myelin sheaths. From their morphological appearance there can be little doubt that they are the  $\pi$ -granules first described by Reich.

*Arise-cylinders.*—The majority are abnormal, showing tortuosity, localized swellings, and altered staining capacity. *Neuroglia.*—There is a considerable proliferation of glia-cells both in the white and grey matter; amorphoid glia-cells are present in the posterior columns. The investing pia mater has undergone a certain degree of thickening, but there is no evidence of cellular infiltration. The vessels of the cord are dilated, and hyaline thrombi are found in a few situations.

*Spinal Nerve Roots.*—In Marchi sections blackened droplets of altered myelin can be seen at more or less regular intervals in the long axes of individual fibres; their position corresponds with the constrictions or nodes of Ranvier.

### REMARKS.

The histological appearances described above amply confirm the observation that, in fatal cases of gas poisoning, the brunt of the damage to the tissues falls on the central nervous system.

The diffuse widespread parenchymatous degeneration throughout the cerebrospinal axis is explicable on the hypothesis that there occurred an intense hæmatogenous intoxication; but at the same time we are left with the difficulty of understanding why particular areas of the nervous system—the cortex cerebri, the basal ganglia, and the cervical grey matter—were so much more severely damaged than other localities. There are few problems which offer greater difficulty than those concerned with the so-called selective action of toxins on the central nervous system, and while it is probable that certain of these are determined by a lymphogenous infection, it is obvious that in the case under consideration some other hypothesis must be advanced to assimilate all the aspects of the problem. Bearing in mind that in coal-gas poisoning carbon monoxide is carried in the blood, it is reasonable to suspect that the distribution of the lesions may be conditioned by certain anatomical peculiarities of the blood-vessels supplying the central nervous system. It will be convenient to consider separately the vascular arrangements in the cortex cerebri and basal ganglia.

*The Cerebral Cortex.*—Perhaps the most striking feature in the case was the zone of softening, limited with great fidelity to the deeper layers of the cortical grey matter. It is obvious that this morbid condition must have occurred in all situations at one and the same period of time, for the stage reached in the removal of the products of degeneration was everywhere the same. If the view that all the symptoms of carbon-monoxide poisoning are referable solely to a lessened oxygen-supply to the tissues be upheld, it is evident that the poorer the blood-supply to any particular area, the earlier and more severe will be the damage to that particular locality. It is therefore a matter of considerable interest to examine the arrangement of the cortical blood-supply with a view to determining the relative

vasculature of its different layers. On this point our knowledge is fairly definite. The investing pia mater supplies two types of vessel, one short and one long, both of which penetrate the grey matter. According to Bignami and Nazari the short vessels are purely cortical and terminate in a brush of fine arterioles in the deeper layers of the grey matter. The long vessels pass straight down to end in the centrum ovale, where each supplies a very narrow territory; anastomosis between these two types of vessel occurs in the deeper cortical laminae.

If the pial vessels are injected with a colouring agent, and a section of the cortical grey matter is examined under a low power, it is seen that the richest capillary network occurs in the infragranular layers—precisely the situation which exhibited such a widespread softening in this case. The areas with the most abundant blood-supply are those in which most damage was sustained, and it appears probable, therefore, that a mere deprivation of oxygen could hardly have conditioned this peculiar distribution of cortical necrosis. On the other hand, if it be assumed that carbon monoxide acts like other exogenous poisons, the infragranular layers with their fine arterial meshes would be particularly exposed to its noxious effects. Moreover, experimentally-produced anaemia of the cortex, by ligation of the vertebral and carotid vessels, shows that the small and medium pyramids are more affected than the cells in the deeper layers: the latter are, phylogenetically speaking, older and less liable to decay than are the more superficially-placed cells. The observation that an impoverished blood-supply leaves them relatively unaffected strengthens the view that an anoxaemia alone could not have produced the peculiar zone of softening seen in this case.

One other factor must be taken into consideration. The commonest cause of cortical softenings is unquestionably arrest of the circulation either by thrombosis or embolism, which is favoured in the grey matter by the anatomical arrangement and fine calibre of the venules and arterioles. Reference has already been made to the presence of cortical hyaline thrombi in all the situations submitted to microscopical examination, and although they occurred in numerous areas in which there was no trace of necrosis, it must be conceded that they played some part in determining the layer of intracortical softening. Their presence has been reported in other cases of carbon-monoxide poisoning in which punctiform haemorrhages and softenings were present in the nervous system. In Mott's case the great majority of red blood-corpuscles showed a basophil reaction, which might be taken as an indication that the carbon monoxide had altered their physical properties in such a way as to favour thrombosis.



The evidence, therefore, is in favour of the view that carbon monoxide exerts its influence in two ways: indirectly, by altering the coagulative power of the blood, and diminishing the oxygen-supply to the tissues; and directly, by a specific action on the parenchymatous elements of the nervous system.

*The Corpus Striatum.*—One of the commonest and most interesting effects of carbon-monoxide poisoning is a softening of both lenticular nuclei. It has been recorded in a number of fatal cases, and appears to be even more characteristic than punctiform hæmorrhages. The lesion need not be a very large one, and, in fact, one must examine closely sometimes to find it.

It seems to be favoured by the peculiar vascular arrangement in this area. In 1898 Kolisko called attention to the existence of a special artery which is given off from the anterior cerebral, near its communicating branch. Though usually single, it is sometimes double, and runs upwards and backwards, supplying the caudate nucleus, part of the anterior limb of the internal capsule, and part of the external segment of the lenticular nucleus. Owing to its length and peculiar distribution, the blood that passes into it has to flow rather against the normal current, and when the general blood-pressure is very low, as in gas-poisoning, a tendency to stasis and thrombosis occurs. He regards its involvement on each side in cases of gas poisoning as the cause of the bilateral softening of the corpus striatum.

Even if Kolisko's views be accepted, any such anatomical explanation cannot be regarded as satisfactory, for other collections of grey matter in the immediate vicinity of the lenticular nucleus, which have practically the same blood-supply, are unaffected. In the case described above, no softenings were found in either the caudate nuclei or optic thalami, while in the globus pallidus lesions visible to the naked eye were found. Their appearance in areas immediately surrounding the vessels suggests that carbon monoxide has, in common with certain other poisons, a peculiar affinity for the tissues of the lenticular nucleus. While it is interesting to note that toxins in the general circulation are brought into closer relationship with the grey matter than with the white, it must be confessed that in the present state of our knowledge no adequate explanation can be given of the selective action of poisons on the nervous system.

*Spinal Cord.*—The morphological appearances in the spinal cord may be considered as indicative of a subacute hæmatogenous infection of the nervous system, and it is interesting to note that they tended to diminish in a caudal direction. The disappearance of nerve-cells and the wasting of the left anterior horn of grey matter in the first dorsal segment are in harmony with the clinical observations.



It will be remembered that on the third day of his illness the patient presented some wasting of the small muscles of the left hand, which was followed more than a fortnight later by a similar affection of the opposite hand; the more normal appearance of the right motor horn is explicable on the assumption that sufficient time had not elapsed for atrophy to become evident, although the individual nerve-cells had largely perished.

The numerous brilliantly-stained metachromatic granules found in sections which had been fixed and hardened in alcohol do not appear to have been previously noted in gas poisoning; they may be regarded as a catabolic product of the parenchymatous nerve-tissue.

Lastly, it is necessary to consider the reaction of the fixed connective-tissue cells in the cerebral hemispheres and brain stem.

It has been emphasized by Orr and Rows that the lesions in hæmatogenous intoxications are of a degenerative nature, and differ widely from those found in lymphogenous infection, in which the morbid phenomena of an inflammatory type reach their maximum. Although degenerative changes, very widespread in their distribution, were the most prominent feature in this case, the cellular proliferation in the adventitial sheaths of many of the vessels was undoubtedly of inflammatory nature. The possibility must therefore be entertained that some other morbid condition may have been present before the nervous tissue was exposed to the highly destructive action of coal gas. The presence of lymphocytes, plasma-cells, and rod-cells, the appearance of increased vascularity in the cortex, and the subacute decay of the ganglion-cells, are suggestive of a syphilitic infection. On the other hand, it must be noted that the brain showed no obvious cortical wasting, the microscopical features were evenly distributed throughout, and the ganglion-cells above the zone of softening preserved to a large extent their columnar arrangement. Moreover, a careful microscopical examination of the floor of the fourth ventricle did not reveal the presence of any ependymal granulations.

The altered chemical constitution of the cerebrospinal fluid was also suggestive of brain syphilis or dementia paralytica, but it would be surprising to find a normal fluid in gas poisoning associated with such profound degenerative changes in the nervous system. On the clinical side reference was made to an attack of mental depression which occurred in early middle life; the second attack appeared to be of a somewhat similar character, but with a more pronounced loss of the self-preservative instincts. There were no mental symptoms suggestive of general paralysis, and throughout the illness the pupils preserved their normal reaction to light.

On the whole the evidence does not favour the view that the patient was in the incipient stages of general paralysis, but the possi-

bility of a syphilitic infection cannot be entirely excluded. I shall therefore be content to leave this question undecided.

Finally, it may be stated that death in this case appeared to be due to heart failure, which may have been partly conditioned by the severe degeneration of the vagus nerves.

There can be little doubt that, had the patient survived, a profound degree of dementia would have supervened, for the intracortical zone of encephalomalacia was so widely distributed and so placed as almost to isolate the supragranular layers, which are thought to be concerned with the higher associations of intellectual life.

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## SOME FACTORS IN PSYCHOTHERAPY.

BY WILLIAM BROWN, LONDON.

THERE is no panacea in the treatment of the psychoneuroses. Different schools of thought may tend to emphasize one or other factor of cure, but there can be little doubt that these factors are many, and that a rational psychotherapy should take account of all. Their relative importance and psychological relationships to one another can be finally decided only by reference to a scientific knowledge of the causes of this class of nervous disease. The theory that the nature of these causes is shown by the conditions of the cure is but a half truth, and may be positively misleading in some cases. A much wider psychological analysis of the whole situation is needful to satisfy the demands of science.

During the late war, out of the thousands of soldiers suffering from one form or other of psychoneurosis, it was possible to meet with many in which the conditions of the onset of symptoms were greatly simplified, and the results of treatment correspondingly definite and scientifically instructive. In other words, relatively 'pure' cases occurred which showed the working of isolated psychological factors in a clear light. This was especially so with cases treated in the field shortly after the moment of onset of their symptoms. In about 15 per cent of such cases which came under my observation in France, a well-marked symptom was an *amnesia* of greater or less extent for events immediately following upon the shell-explosion or other emotion-exciting incident which originated the illness. Accompanying this amnesia were functional symptoms of a physical nature—mutism, deafness, anæsthesias, tremors, paralyses, contractures, etc. I found at first that if I restored these lost memories under light hypnosis, the physical symptoms tended to disappear more readily—under the influence of rest, explanation, rational persuasion, etc.—than they did if the amnesia was left untreated. This general result illustrates the working of *re-association* or *psychosynthesis* as a definite factor in psychotherapy, and agrees with the findings of Dr. C. S. Myers<sup>1</sup> while working with similar cases. The reintegration of the mind increases its power to grapple with the physical symptoms. But I soon found that if I made a special effort to recall the accompanying emotion (fear) in all its original vividness and detail, along

with the missing memories, the patient passed into a 'second state', in which he could speak (if he was previously mute) and was free from all his physical symptoms, just as he was at the time of the shell-explosion. I would let him work off his emotional reaction of fear as completely as possible, and then wake him up from his light hypnosis, after first giving him the post-hypnotic suggestion that he would continue to remember what he had just re-experienced. Some cases cleared up less perfectly than others under this treatment, but in scores of cases the recovery was complete.

It would seem that the continuation of the symptoms was incompatible with the reinstatement of the original fear which had been their apparent cause. The patient had not had sufficient opportunity to work off his fear adequately at the time. The fear became bottled up, and could only show itself indirectly in the form of symptoms.<sup>2</sup> This situation corresponds to those of the 'retention hysterias' and 'defence hysterias' first described by Breuer and Freud,<sup>3</sup> and the psychotherapeutic factor which removed the symptoms is that of *psychocatharsis* or abreaction. The fear was worked off later, and so the symptoms were deprived of their underlying support. I have myself explained the mechanism in terms of re-association in a recent article,<sup>4</sup> but I am inclined to think that a further mechanism is involved, viz., an actual persistence of a past emotion in the unconscious, under certain conditions of mental conflict and repression. By experiments on some of my hypnotic patients I have satisfied myself that the emotions of early life, even those of the first two years, can persist, and be recalled in their original form under hypnosis.

The above results were obtained by means of light hypnosis, but I do not wish to over-emphasize the importance of this method in psychotherapy. Where gross amnesias of a hysterical nature occur, as in so many war cases, it is the most rapid and satisfactory method of clearing them up; but in other cases it should not be used. One very rarely has occasion to employ it in civilian practice. Here waking suggestion, persuasion, and mental analysis suffice.

In my opinion, hypnotism and suggestion do not coincide. All men are more or less susceptible to suggestion, but hypnotism is something more definite than this. It involves a definite dissociation, and the state of hypnosis is a 'second state' (which is not *always* a state of increased suggestibility) and corresponds to the condition of the hysteric. Among the hundreds of hysterics whom I treated during the war, I found that the degree to which they were hypnotizable corresponded with the degree of their hysteria or dissociatedness. As they became cured they became less hypnotizable, although they retained a certain amount of suggestibility.

Dr. W. McDougall<sup>5</sup> dissents from this view, and finds "that a

large proportion of normal persons can be hypnotized, and that [his] patients remain hypnotizable when cured." I cannot help thinking that he is here using the word hypnosis where I would use the word suggestion. I would add that I certainly do not adopt the 'domineering attitude', as he calls it, when hypnotizing patients. Quite the contrary. I ask them to relax their muscles, fixate a bright object for a short time, and think of sleep. I do not even mention the word hypnosis. Moreover, the submissive attitude is certainly not sufficient to ensure hypnosis, as he seems to imply in his paper. One meets with patients who are exceedingly anxious to be hypnotized, and are exceptionally submissive, but who have been unable to reach the hypnotic state.

One can artificially increase the suggestibility of most normal people by appropriate means, but to my mind this increased suggestibility is not *eo ipso* hypnosis. On the other hand, when the memory continuum of the patient is broken across in hypnosis we have a psychological phenomenon quite distinct from that of suggestibility, and calling for a distinct explanation. Dr. McDougall has himself given us a most interesting explanation of it in terms of physiological dissociation.<sup>6</sup>

A psychotherapeutic factor closely akin to re-association is the process whereby the patient gains an ever-deepening insight into the exact nature of his mental condition. It is a complex psychological process in which the patient endeavours to obtain an objective view of his own mind, its past development, present condition, and strivings towards the future, so far as his symptoms are concerned. It is more than a mere intellectualizing of the mind—although this is a very important element—since it stimulates and purifies that power of intuition or direct insight as regards psychological matters which all men possess to a greater or less degree. Schopenhauer has made the statement that "genius is simply the completest objectivity".<sup>7</sup> In a less degree, objectivity is a condition of mental health or sanity in all men. I have suggested the term *autognosis* (self-knowledge) for this process. In practice it takes the form of long talks between the physician and the patient, in which the latter is encouraged to describe as minutely as possible his exact feelings and thoughts at the time of the outbreak of his symptoms and just before, and also his present mental condition, his hopes and fears for the future, his regrets for the past. He is then led backwards in memory, and encouraged to discuss emotional memories of the past, especially those where he failed to adapt himself adequately to his physical and social environment. In this process he will from time to time display emotion of one kind or another, and give the impression that he is completing the emotional reaction to a past situation to which he had not had



the opportunity of reacting adequately at the time. This is the factor of psychocatharsis to which we have already referred. He is also encouraged to look at his wishes, longings, interests, ambitions, and personal relations with others from all points of view, to adjust them to one another, to seek out and eliminate contradictions, etc. It is this kind of intellectual work that strengthens the healthy part of his mind and cuts the ground from under his symptoms. His dreams may also be analyzed, and will be found to throw light upon his memories of the past and his aspirations for the future, as well as upon the difficulties of the present.

The method differs from psycho-analysis in all its forms, in that the theories and presuppositions of the psycho-analytical schools are not necessarily involved. It includes education in its literal sense—a drawing out of latent powers and ideals,—and an element of suggestion springing from the affective bond of mutual interest between patient and physician—a form of suggestion which is *not* incompatible with the patient's self-reliance.

The autognostic method is applicable to all forms of psychoneurosis, and should be used with all, even if symptoms have already been removed by other means. In *a certain class of cases* it may give findings that correspond with the theories of psycho-analysis. In such cases it should, of course, be called psycho-analysis, and make use of whatever Freudian conceptions the treatment demands for intelligibility and therapeutic success. But in many cases this result does not occur. To use a metaphor from mathematics, the findings and results of autognosis are to those of psycho-analysis as the properties of the general conic are to those of the circle.

I would call a case a Freudian one when its analysis brings to light very early memories of excessive interest in the excretory functions, of sadism, masochism, exhibitionism, etc., which have subsequently given rise to mental conflict followed by repression. From my personal experience with patients I can confirm the existence of such cases. The analysis is usually a very protracted one, extending over many months, and showing strong 'resistances', which have to be overcome by persistent urging on the part of the physician. Dreams give important clues, and provide invaluable material for the analysis. In fact, dream-analysis may form more than three-fourths of the entire analysis. I have recently analyzed a patient suffering from an obsessional fear of infection. This phobia had grown more and more oppressive, extending to more and more objects, so that she was forced to devote a very large part of her time and energy to washing and to other precautionary measures. In the course of the analysis, especially in the dreams, thoughts of lavatories, etc., eventually began to recur persistently,

and at long last it became manifest that in early life she had experienced inordinate interest in excretions, from which she had failed to free herself in later years, despite great effort. The interest had persisted in great strength in her unconscious, and her conscious efforts at self-defence or repression had taken the form of an ever-extending phobia of infection. The phobia did not appear until the age of puberty, and even then was not very pronounced. Ten years later, a hopeless love affair coincided with a nervous breakdown in which the phobia appeared in great force as the main symptom. She at first feared carrying infection (tuberculosis) to this particular person. Later on the fear became more generalized. The improvement produced in this patient by means of the analysis was partly due to the autognotic factor, whereby she had gained an objective view of her own mentality, and had replaced a false (and alarming) view of her illness by a sane and rational one.

In other Freudian cases, the roots of the psychoneurosis are found to be early memories of intense affection for the parent of the opposite sex and concomitant jealousy towards the parent of the same sex (Oedipus complex). I can illustrate this by another of my own cases. The patient was an unmarried lady who had suffered ever since the age of puberty from an impulse to kill, as well as from other minor impulses of a criminal nature. For more than twenty years she had struggled with this illness, giving herself up to many kinds of mental treatment—suggestion, rational persuasion, etc.—but all in vain. Several doctors had tried to hypnotize her without success. She came to me hoping that I would be able to do so. I found her very suggestible towards me, but not hypnotizable. I treated her by means of psycho-analysis, and after forty hours her symptoms had completely—and, apparently, permanently—disappeared. She had always been exceedingly fond of her father, now dead, and could remember her mother saying to her when she was quite small, “You are trying to steal father from me.” In the course of the analysis, she eventually seemed to remember a night, at the age of 5 or 6, when she slept in the same bed with her father. On waking up the next morning she had a feeling of hatred and horror, as if something had happened to her in the night. These feelings changed into love again during the following days. At the age of 13 her symptoms broke out. Some years later, she noticed on going one morning into her father’s sick-room that a murderous hatred suddenly boiled up within her. She attributed it to her obsession, and was horrified by it. Before that moment the obsession had not referred to her relatives. The feeling disappeared and did not return. When she had brought herself to confess to me the early ‘memory’, all her neurotic impulses disappeared at once, as if by magic, and she

broke off the analysis, as she had to return home. But she found the symptoms back again a few days later, as I had expected, and she came to me once more. Further analysis showed that she had transferred to me the feelings of affection that she had felt towards her father, and had then repressed them a second time. A few hours' talk sufficed to overcome this second repression, and the symptoms once more disappeared. As far as I know, the cure is now a permanent one. I feel little doubt that the early 'memory' which she seemed to recall was really a 'phantasy', having psychical reality but no reality in the outside world. I explained this possibility to her, and she found that she could accept it. The phantasy corresponded to her repressed sexual feelings, and illustrated the working of the factor of *regression*. In her own view her impulse to murder referred to her father, not to her mother. There is much more that I might say in further explanation of this case, but I content myself with this short summary, as my main object here is to show that the facts upon which Freud bases his theory of psycho-analysis do admit of verification in certain types of patients. Whether his 'libido theory' can hold its ground as a general theory true alike for normal and abnormal psychology, is a question that has yet to be decided. Even this case does not fit in entirely with his theory. The factor of *transference* which it appears to illustrate is not entirely clear, and needs further discussion in another place. The patient showed herself to be exceedingly suggestible throughout the analysis, although I should add that her early 'memory' was certainly not suggested to her in any way by me, as it was a great surprise to me. I was at that time very sceptical about Freud's sexual theory, although trying to preserve an unbiased mind. The one thing that I did insist upon, as of course I always do in psycho-analysis, was that the patient should tell me everything that came into her mind.

In conclusion, I would like to emphasize the factor of *suggestion* as a *vera causa* in psychotherapy. In the case, especially, of bad habits such as enuresis and masturbation in children, analysis and persuasion often fail where repeated suggestion produces a complete cure. In my own method, I ask the patient to relax his muscles as completely as possible while lying on a comfortable couch, and to think of sleep, and I continue this treatment for an hour at a time, giving appropriate suggestions every ten minutes. Every case of enuresis that I have treated has cleared up completely by this method. Psychotherapists seem rather afraid of championing suggestion treatment nowadays, lest they be considered out-of-date and superficial. But in selected cases it is all that is needed for complete and permanent cure. I of course assume that a thorough neurological and psychological investigation is first carried out. Freudians find

a difficulty here because of their identification of suggestion and transference,<sup>8</sup> a view which I cannot entirely accept. The training of children into good habits, even in the first few days after birth, illustrates the enormous potency of suggestion, and its relative independence of transference.

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## ATAXIA, ASAPHIA, AND APRAXIA IN SPEECH.

BY E. W. SCRIPTURE, LONDON.

THE best available method of recording speech is that shown in *Fig. 1*. The patient speaks into a wide tube. The vibrations and puffs of air pass to a flexible membrane, the movements of which are enlarged and recorded by a light lever.

An inscription of 'pa' spoken by a normal voice is given in *Fig. 2A*. The straight line at the start corresponds to the time in which the lips were closed for 'p' (the occlusion). As the lips open,

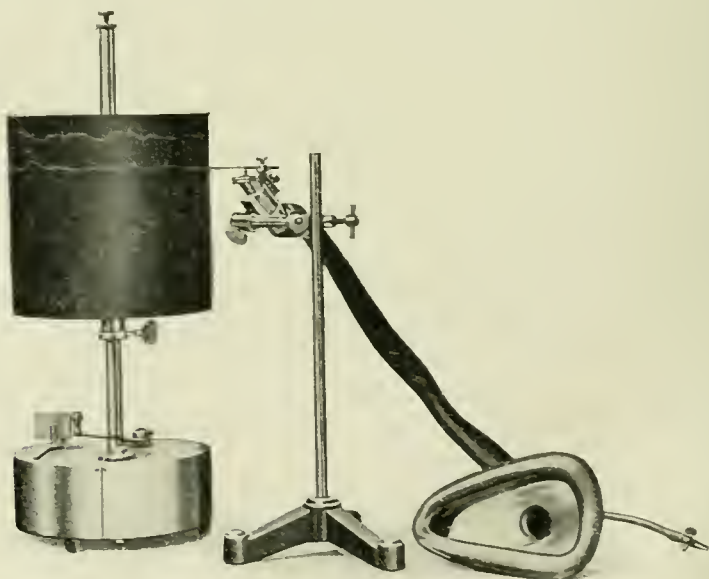


FIG. 1.—APPARATUS FOR MAKING INSCRIPTIONS OF SPEECH.

The vibrations of air pass down the wide tube to a flexible membrane, and are recorded on smoked paper around a revolving drum.

a puff of air (the explosion) drives the line upward. This is followed by the vibrations of the vowel.

Even the simplest speech sound requires accurate co-ordination of the movements of many muscles. To make the sound 'p' the lips must be correctly closed by the muscles round the mouth. At the



same time the velum must be raised to cut off the nasal passage. The muscles of breathing must produce the proper air-pressure behind the lips. At a certain moment the lips must open, before the velum drops or the breath pressure is relaxed. These actions must be begun, continued, and ended at definite times and with definite degrees of force. The slightest error in the regulation will produce a modification of the sound. If the velum is not kept lightly closed for the whole of the time, the sound gets a nasal character (as in velar paralysis). If the pressure of the lips is not kept firm (as in muscular dystrophy), air issues between them and the sound is no longer occlusive (*Fig. 2B*). If the larynx vibrates during 'p' (as frequently in bulbar paralysis), the sound is like a 'b' (*Fig. 2C*). If the time for 'p' is too long (as may occur in disseminated sclerosis), the sound becomes like that of a certain dialect (*Fig. 2D*). If the breath pressure is relaxed before the lips are opened (as in some types of neurasthenia), there is no explosion and the sound is like that of a French 'p' (*Fig. 2E*). The possibilities of disturbance are thus manifold even in a single syllable like 'pa'.

For the various muscles to be co-ordinated in a movement, the impulses to contraction that are sent to them from the nerve centres must be exactly in their right relative amounts at each moment, and they must last for exactly the right times (innervation taxia).

If the impulses to the individual muscles are not properly

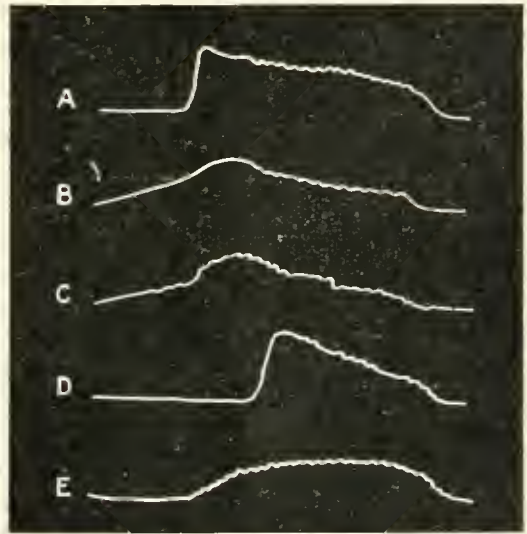


FIG. 2.—INSCRIPTIONS OF 'PA'.

A. *By a Normal Voice.*—The inscription begins with a straight line corresponding to the closure of the lips (occlusion) for 'p'. The sudden rise of the line is due to the escape of air (explosion) as the lips are opened. The small waves register the vowel vibrations.

B. *By a Case of Muscular Dystrophy.*—The weakness of the lips hinders the complete closure for 'p', and the escaping air gradually raises the line. There is no explosion because there was no complete closure.

C. *By a Case of Bulbar Paralysis.*—The weakness of the lips hindered the complete closure. The larynx began quite improperly to vibrate during the 'p'. The vibrations are irregular on account of the flabbiness of the vocal cords.

D. *By a Case of Disseminated Sclerosis.*—The lips were held tightly closed for a longer time than normally. The sudden irregularities in the vowel vibrations are a record of the fine intention tremor in the spanners of the vocal cords.

E. *By a Neurasthenic.*—The enunciation was thin and weak. The lack of the explosion for 'p' shows that the breath pressure was allowed to fall before the lips were opened.

co-ordinated, the resulting action is incorrect. The patient with disseminated sclerosis moves his finger in a jerky way when he tries to touch an object. He knows very well that his movement is not correct, but he is unable to adjust the nerve-impulses to the muscles correctly (innervation ataxia). The intention-tremor of the cricothyroid muscle in disseminated sclerosis causes jerks in the tension of the vocal cords. The vibration of the cords therefore becomes suddenly and briefly irregular from time to time. This is shown clearly in *Figs. 2 D* and *3 B*. In none of the records of disseminated sclerosis I have made has this phenomenon been missing, although several cases showed no voice change that could be detected by the patient or by anyone else. In these cases, even after the record had shown the presence of the peculiarity, the ear could not perceive it. Siemerling asserts that in disseminated sclerosis there are minute lesions in all parts of the nervous system. This would include the taxic centres for the larynx. Every case of disseminated sclerosis

would thus be expected to reveal itself in a speech inscription.<sup>1</sup>

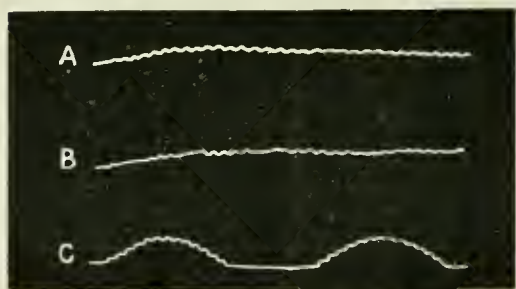


FIG. 3.—INSCRIPTIONS OF 'AH', SUNG.

A. *By a Normal Voice.*—The waves are quite regular. The line rises and remains at a constant height: this indicates a constant breath pressure.

B. *By a Case of Disseminated Sclerosis.* The vibrations show sudden jerks due to the intention tremor of the spanners of the vocal cords.

C. *By another Case of Disseminated Sclerosis.*—The waves come in groups separated by straight lines. This corresponds to the emission of the vowel as a series of short sounds separated by silences.

each instant; they do not know, and consequently the impulses are poorly adjusted (sensory ataxia). Although inscriptions have been made in over twenty cases of tabes, there was only one instance in which any abnormality of speech was found: this consisted in a momentary irregularity of the laryngeal vibrations like that in disseminated sclerosis.

The irregularities due to ataxia are opposed by an effort at control; the result of this effort may be termed 'anataxia'. The tabetic tries to keep his legs from flinging about (on account of sensory ataxia) by specially forced contractions (anataxia) that produce the

In order to co-ordinate the impulses in time and force there must be sensations passing up from the muscles, so that their exact degrees of contraction at any moment can be used to regulate the impulses (sensory taxia). In tabes these sensations are lost. A tabetic patient could move his leg with accuracy if only his innervation taxic centres could know just what the leg was doing at

familiar stamping gait. The patient with disseminated sclerosis feels his muscles jerking irregularly and makes efforts to control them. The extra efforts are so strong in some cases that, even in speaking, the patient will perspire profusely. The effects of anataxia from a case of disseminated sclerosis are illustrated in *Fig. 3 C*. Instead of a smooth sound as in *Fig. 3 A*, the patient emits a series of short pieces of vowel separated by silences.

The individual muscles may be so well controlled that each sound would be considered to be made correctly if it were standing alone, and yet the complete sounds might vary abnormally from one another.

*Fig. 4* shows the first portion of "Peter Piper's peppers" spoken by a paretic, in whose speech the ear could detect no abnormality whatever. Each 'p' shows a record of occlusion (straight line) and explosion (upward jerk). In normal speech the occlusions would be all nearly the same in length, and the explosions nearly the

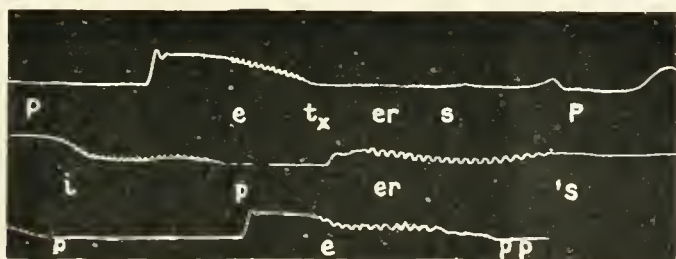


FIG. 4.—PORTION OF AN INSCRIPTION BY A PARETIC.

The occlusions for the 'p' are not the same in length; the explosions differ in strength.

same in strength. Here some occlusions are longer, some shorter; some explosions are stronger, some weaker. The irregularity is in the entire form of the 'p', not in the action of the individual muscles used to make it. The irregularity is in the agreement in the type of sound to be regarded as a correct 'p'.

The control of types of movement has been termed—not quite fortunately—"cortical ataxia". A paretic is said to show 'cortical ataxia'. As this control of types is really something quite different from the control of single muscles it needs a separate name: 'saphia' (Greek *σαφής*, precise) will be used here.

Just as a tabetic tries to overcome his ataxic gait by special efforts, so the paretic combats his unprecise movements (asaphia) by efforts at extra precision (anasaphia). A paretic will often remark that he can speak correctly as long as he can speak slowly. The slowness would thus be a part of his anasaphia. Many paretics speak with excessive care; their enunciation is like that of an over-precise

orator. The uncertainty of enunciation is successfully combated by an extra effort at precision. It is often the case that a parietic will repeat a word correctly when he hears or sees it alone, but will do it incorrectly when he is off his guard by using it in a sentence. Both the slowness and the over-preciseness are phenomena of *anasaphia*.<sup>2</sup>

The speech of persons who have become hard of hearing often gradually changes. It loses more or less of its melodious intonation. It may become irregular in loudness. Various sounds may lose in their distinctness. Although the speech organs show no defects in their movements, they do not make quite the movements desired. What the speech organs actually accomplish is normally controlled mainly by hearing. When this guidance is lessened, the speaker may fall into lax and incorrect habits. This condition may be termed 'sensory asaphia', in contrast to the 'motor asaphia' of the parietic.

Just as the muscles are co-ordinated for simple movements, so complicated movements are grouped and co-ordinated for more general acts. This control of complex movements is termed 'praxia'. *Taxia* is the co-ordination of muscles in such a way that the movements are made correctly in a general way. *Saphia* is the co-ordination so that the movements are accurately adjusted to constant types. *Praxia* is the system of co-ordination that determines which combination and succession of parts of the body are to be moved, which line of movement is to be followed, and which object is to be attained.<sup>3</sup>

*Apraxia* may be defined as "the inability to perform movements or groups of movements intended to carry out a purpose, although all conditions of motility, sensation, and co-ordination may be preserved." "The practical distinction may be drawn that *ataxia* produces unprecise movements, while *apraxia* often produces the wrong ones; moreover, the movements in *apraxia* may not correspond to the purpose in hand, whereas they may correspond to some other purpose. The *apraxic* writes the wrong letter, but the letter itself may be correct."

Liepmann has reported a case with motor *apraxia* of the right arm, the left arm being normal. When told to put the right forefinger on the nose, the patient said 'Yes' and executed wide circling movements of his right hand in the air. When told to put the left forefinger on the nose, he did so correctly at once. When told to make a fist with his right hand, he made various absurd movements; with the left hand the act was done properly at once. When Buck's patient was told to lift his right arm, he crossed it over the body, put his hand in his left axilla, and made various energetic but hopeless movements. "I understand perfectly well what you wish", said he, "but I do not succeed in doing it."



In 'motor apraxia' the government of single movements or of simple groups of movements, such as blowing, whistling, speaking a single sound, etc., is disturbed. In saying "Peter Piper's peppers" the patient may get the words as a whole fairly correct, while making the sounds imperfect in a way not found in ataxia or asaphia: the larynx acts at the wrong times, the lips are closed too soon or too late, the tongue is moved in an incorrect way. The sounds are irregular and distorted. In *Fig. 4* there are vibrations during 't' of "Peter", whereas there should be none. The paretic has inserted a foreign element into the sound.

With 'transmission apraxia' a person attempting to speak a word may make every sound correctly but may get some of them in the wrong places. He may say "Peter's Piper's peppers", putting a correctly formed "s" at three places instead of two. He may know that he has spoken wrongly and may know just what sounds should be in the phrase, but any attempt to speak it produces transpositions and similar errors, because his ideas of the required movements go wrong in being transmitted into action.

The familiar experiment of repeating 'Troy boat' or a similar phrase very rapidly several times by normal persons results in such combinations as 'Troy boyt', 'Tro boat', etc. The person knows what he wants to say (ideational praxia intact): he makes all his sounds correctly (motor praxia intact); but in his hurry the wrong sounds are often used (transmission apraxia). Such phrases ('truly rural', etc.) are frequently used as a test of suspected alcoholism: the intoxication produces not only deformation of the sounds (ataxia) but also substitution as above (transmission apraxia).

In 'ideational apraxia' the person may have a general idea of the action he wants to perform, but his notion of its parts and details is vague or impaired. A patient of Liepmann's received a cigar and a match-box. He opened the box, stuck the end of the cigar in it, and tried to shut the box—evidently carrying out the idea of cutting the end of the cigar instead of striking a match. Then he rubbed the end of the cigar on the side of the box as if lighting a match. A similar error in speech was that of a paretic who spoke of 'sweating fish' instead of 'swimming fish'.

The slowness and over-carefulness in the speech of some paretics must be attributed not only to anasaphia but also partly to anapraxia, that is, to an attempt to avoid the errors of apraxia. By special effort the patient who made the inscription in *Fig. 4* could pronounce the phrase correctly.

The relations of the several kinds of centres may be summarized in the following way: The motor centres receive impulses and stimulate the muscles; the taxic centres control the action of the groups



of muscles; the saphic centres send impulses to the taxic centres requiring movements that correspond to types; the praxie centres prescribe whole words, phrases, and expressions in speech.

On command to express a certain idea, the mind orders the praxie centre to speak the phrase "Peter Piper's peppers". Lower centres order that it shall be spoken as similar phrases have been spoken before. The saphic centres order that all the sounds shall conform to the typical sounds of English as they have been learned. The taxic centres select the muscles required for each sound, and look after their action.

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- <sup>3</sup> LIEPMANN, "Das Krankheitsbild der Apraxie", etc., *Monats. f. Psychiat. u. Neurol.*, 1900, viii, 15, 102, 182. WILSON, "Contribution to the Study of Apraxia", *Brain*, 1908, xxx, 164.

## THE ACUTE CONFUSIONAL STATES IN THE PSYCHONEUROSES.

By W. JOINSON, LONDON.

### INTRODUCTORY.

THE frequency with which mild states of confusion have been encountered amongst the patients in an Army centre for psychoneuroses has not, as yet, received general appreciation. In the later treatment of discharged soldiers who have suffered from 'breakdowns in the line', this observation will assume a considerable degree of importance. On an average, out of some thousands of soldiers admitted to the centre (under the military term, N.Y.D.N.), about 10 per cent showed definite evidence of confusion. In the majority of these cases—about three-fourths—the confusion was of short duration, lasting twelve to twenty-four hours, and was altogether simple and transient in character. They were described in the notes under the following phrases—"appears dazed", "looks strange", "is inclined to behave foolishly", "is dull and takes no interest in anything", "does not appear to understand questions", "stares vacantly about", etc. This type may, for the purposes of this paper, be classified as *the mildly confused group*. In the remaining quarter of the 10 per cent the cases presented quite distinctive features, and will be described under the term *the severely confused group*. Here the confused state was profound, and usually persisted for from seven to ten days. For these patients a special mental ward was provided, and during the time the centre was open this ward was invariably in occupation.

### CAUSATION AND PROGNOSIS.

The etiological factors concerned in these states are of a similar nature to those which lead to 'acute nervous exhaustion' or 'a breakdown' under the ordinary conditions of life. In the case of the fighting soldier, however, the immediate factors are essentially more intense, and acute strain has been borne for longer periods, than would be the case with a patient in civil life. No doubt the age, good physique, and stamina of the average soldier are responsible for this difference, as also for the rapid convalescence which was usually observed. The hereditary factor, too, which may be important in

civil cases, is relatively insignificant in war cases, and indeed I frequently found it impossible in the case of a soldier to obtain anything in the nature of a bad family history. On more than one occasion a case has come under my observation where a man of good physique, and possessing an excellent military record, has appeared to have been completely 'broken' by the poignant character of his ordeal rather than by any inherent weakness of his own. As a rule, the way towards a breakdown has been paved by the presence of etiological factors of a less acute nature but which have acted over a long period. Such are monotony, enforced resignation to trench life, the constant assumption of a forced cheeriness as a cloak for a real feeling of anxiety and worry, with, finally, prolonged periods of irregular feeding and insufficient sleep. The importance of the toxic factor has seemed relatively to be small.

**The Psychic versus the Physical Factors.**—Amongst the etiological factors, emotional disturbance has, in my experience, been by far the most active. In investigating this question amongst some hundreds of cases, I found that 60 per cent were purely psychic in origin, and 40 per cent had been in the immediate vicinity of shell explosions and might therefore be considered as resulting from concussion. In view, however, of the fact that very few of this 40 per cent showed any physical sign of concussion of the central nervous system, it would appear to be difficult to refute the suggestion that in the majority of these possibly-concussed cases psychic disturbance had played the greater rôle. It will be readily admitted that in a certain margin of cases the two factors—psychic and physical—must be operative in the same patient, and therefore no accuracy should be claimed for those figures which attempt to separate cases distinctly into the two groups. Of the confused patients with which this paper deals, less than 5 per cent presented clinical evidence of concussion of the central nervous system. Doubtless many other cases were slightly concussed without any temporary paresis or paralysis being observed. The writer feels that the proportion of 7 or 8 per cent would accordingly form a generous estimate of the occurrence of physical concussion amongst these confused states. At one time an effort was made to diagnose psychic from concussion cases on the clinical evidence alone, and to confirm the diagnosis by subsequently obtaining the man's history. A certain measure of success was obtained in the extreme cases of either type, but in the majority clinical evidence by itself proved misleading. Thus, inequality of the pupils in an irritable confused patient often occurred with an entirely negative history of concussion; and in one outstanding instance a patient was admitted in an apathetic state, complaining of headache, and with a pulse-rate of 60, where inquiry showed the man was the

subject of a purely emotional breakdown. An examination of the tympanic membranes, and the discovery of a recent tear in one or other membrane, has occasionally been a valuable aid in the diagnosis of concussion.

In those cases which are due to actual concussion, a noticeable feature has been the relative freedom from subsequent subjective ills as compared with those which are due to emotional disturbance. In both types, however, the individual must necessarily emerge from convalescence bearing, as it were, a 'psychological scar'. In later life evidence of this damage may only be observed during times of excitement or emotional stress, and at all ordinary times the individual's behaviour may be within normal limits. Some, it must be realized, become definitely changed in character, and perhaps troubled with mild forms of obsession, which may become the bane of their existence. Thus, unless the man's earlier history be known (and this must include his pre-war, as well as his during-the-war, condition), a due appreciation of his case will not be possible. More especially one would wish to lay stress on the particular experience which immediately preceded the onset of the confused condition. This experience has frequently been one of horror and severity almost passing imagination. Examples have been frequently described, and many of them read more like fantastic tales than actual experiences through which a man has lived. It is only by full appreciation of this aspect of a case that one is able to assume the correct attitude towards one's patient.

### I.—THE MILDLY-CONFUSED GROUP.

The essential points about the cases falling into this group are, as already mentioned, the shortness and mildness of the confusional state, and the rapid recovery which ensues.

1. *The Simple Type.*—Cases which, for want of a better term, are afterwards diagnosed as 'neurasthenia', frequently present an initial stage of slight confusion. The patients carry out simple commands—such as putting out the tongue, etc., and, after an unduly long latent period, will answer a few simple questions, such as name, age, etc. They, however, fail completely when questions are persisted in, and are quite unable to give a connected account of themselves. They may have no knowledge of what has happened to them in the line, or of their journey down to hospital. They may supply here and there an incident, but links are wanting in the chain of events. The commonest form of amnesia is the one in which the soldier can recall events in the line until a certain thing happened, and then his memory becomes a blank. Usually he 'comes to himself' in the ambulance a few hours later. More rarely the amnesic period has been more

extensive, and the patient has been unable to recall the events which had immediately preceded his loss of memory. Amongst my patients, it was very rare indeed to find a case where the amnesia extended into pre-war days, home life, etc.

*Illustrative Case.*—Pte. L., age about 25, of good physical development and appearance, was admitted in an excited and confused state. He recognized no one round him, and did not know where he was. With some difficulty he was induced to give his name. He kept looking anxiously about the ward and asking "Where am I?" He was continually getting out of bed, but if spoken to he would return quietly. Altogether he was very irritable and troublesome. After his first night's sleep he awoke almost completely recovered, and only complained of headache. His statement then was: "I was assisting Lieut. — in looking after some wounded. We had had several bombardments. I went outside the dug-out for fresh air, and I remember climbing the steps to get out. The next thing I knew, I found myself in bed, and wondered why they would not give me my clothes."

This patient had only been in France a few months. Apparently the sight of several wounded men had affected him deeply. Two days after admission he was doing useful work in the ward. At no time whilst he was under observation did the physical signs show any definite variation from the normal, and in fact, after the first few days, there was nothing—objective or subjective—remaining to indicate that he had passed through a period of confusion.

*TREATMENT.*—In patients presenting this simple type of acute confusion, it is not always necessary to give a sleeping draught as a routine measure. If, however, after the first two or three hours the excitement and restlessness have shown no signs of abating, a full dose should be given. As a rule, the majority of cases have settled down rapidly with absolute quiet in bed and appropriate feeding. Early movement of the bowels should be obtained. It would seem of importance that these patients should be disturbed and questioned as little as possible. Tactless examination, apart from increasing the state of excitement, may tend to focus the patient's attention on his loss of memory, or on his late experiences, and convalescence may in this way be adversely affected. After twenty-four hours' absolute rest, most patients are able to volunteer a fairly complete account of themselves. Many cases subsequently complain of various subjective symptoms, chiefly headache, buzzing sensations in the head, disordered sleep, feeling of bodily fatigue, and a marked tendency to emotionalism. Frequently the patient presents a fine tremor of the hands and an excitable pulse. These form the basis for the diagnosis of 'neurasthenia' which sooner or later is often applied to these subjects of mild confusional attacks. Further, it should be noted that owing to the mildness of this subsequent 'neurasthenic' condition, a patient is liable to meet with scant sympathy, and may be returned prematurely to duty.



The treatment of these patients in the final stages, which was adopted in the centre, was as follows: (a) Graduated physical exercises carried out twice daily for usually two or three weeks; and following this, (b) The patient has been sent for one month's work (agricultural, etc.) in a back area, before he actually rejoins his unit. On the average, therefore, this procedure ensured that a patient who had exhibited this simple form of confusion obtained six or seven weeks in which to convalesce. One would wish to emphasize the advantage of such an arrangement as this, in which more than half the period of convalescence was spent, not at home in England, not even at the base in France, but within the Army area in the performance of useful duties.

**2. Hysterical Type.**—A fairly characteristic form of mild confusion is associated frequently with hysteria, and can be observed in the earliest stages before any definite hysterical manifestation has become established. The hysterical manifestation, one must remember, is, after all, only the expression, and not the substance, of hysteria, which is constituted by the abnormal mental attitude of the patient. Seen in the earliest phase, the patient usually lies quietly in bed with his head under the clothes. His desire is to lie undisturbed and hidden, and, if interfered with, he is inclined to be resentful, and will sit up glaring about. Repeated efforts are necessary to induce him to perform simple movements, such as closing his eyes. He gives one the impression of having understood what is asked of him, but refusing to carry out the action. When eventually he does obey, his actions are incorrect. Instead of closing his eyes, he blinks spasmodically, or puts his face through a series of contortions. Frequently he will break off in the middle of his movements, lie down in bed, and abruptly turn on his side. As a rule, a single night's rest is sufficient to dissipate this attitude, and the patient then becomes the ordinary hysterical type, presenting mutism, coarse tremor, paresis, or paraplegia, as the case may be. Less frequently the confused state is somewhat deeper, and the patient appears not to understand anything said to him. The result of disturbing him is to cause him to shriek out, and to produce a severe outbreak of emotionalism (passionate weeping, etc.), which is often associated with the revival in his mind of some harrowing experience. Such cases usually take four or five days before anything approaching normal emotional control is regained, and, the patients have later proved themselves to be exceptionally emotional individuals by nature.

*Illustrative Case.*—Gunner M., age about 27, a man with inferior physique. He lay in bed with his head under the blankets. When one uncovered his head, his gaze became fixed, and he had the appearance of witnessing some terrifying spectacle. This lasted for a few minutes, and

he then broke into loud weeping. He only appreciated questions when these were shouted loudly. He could neither speak, sit up, nor walk. When placed on his feet he collapsed limply, rolled on the ground, and then assumed a position of opisthotonos. On relaxation occurring, a mere touch was sufficient to reproduce this state of opisthotonos. Repeated attempts were necessary before his attention could be secured, and he soon relapsed again into his state of fixed staring. Gradually his attention was obtained for longer and longer periods, during which his mutism and paraplegia were treated stage by stage. He returned to the ward able both to speak and walk.

**TREATMENT.**—The above case will serve to illustrate the wisdom of allowing a patient time to recover from the confused state before undertaking the cure of his hysterical symptoms. In this particular instance the case was treated at the expense of much greater stress to both doctor and patient than would have been necessary later. In such cases a delay of three to four days with the patient in a suitable 'ward atmosphere' should invariably be made. The danger of provoking an emotional outburst during treatment will then be found to be practically nil, and hysterical manifestations can be dispelled with much greater ease.

## II.—THE SEVERELY-CONFUSED GROUP.

As a rule the patients in this group were men with long fighting service, with a past history of wounds and sickness or of having been blown over by shells. In a certain number where this history was not obtained, and the soldier had only a few months' service to his credit, it was found either that a previous breakdown had occurred in civil life, or that the patient was young and of such a type temperamentally that he would obviously not sustain the conditions in the fighting area for long. In many cases, too, reports were received stating that a change had been noticed in the man's behaviour with his unit for some time past; that he had become unreliable and gloomy; as a rule he had been restless, unable to sleep, and, whilst in the line, frequently parading sick with complaint of severe headache.

*On Examination.*—The general appearance was one of exhaustion, the patient usually being in poor physical condition. There was fine tremor of the hands, over-action of facial expression, a state of general sweating, rapid pulse (100 to 120), exaggerated tendon reflexes, cutaneous hyperæsthesia, and an irritable reaction of the pupils to light. Occasionally an opposite condition was observed. The tendon-jerks were diminished, cutaneous sensation was dulled, and the pupillary reaction to light was slowed. This state usually indicated that the condition of confusion had already lasted several days. I examined the urine in many cases, and never found the presence of sugar or albumin.

1. **The Shorter Type.**—The cases falling within this sub-group seem, on account of their transient character, to come appropriately under the term, 'exhaustion psychosis'. They, however, exhibit an acute confusional state of a more profound nature than those described under *Group 1*, and one which lasts three, four, or even five days. When seen within a few hours of the onset, the patient is wildly excited, and will not remain in bed. He keeps up a constant muttering, snatches of which are intelligible, and are found to refer to his late experiences in the line. He occasionally shouts out loudly, and trembles with terror, or bursts into tears. No coherent answer can be obtained to questions, although his attention may be gained sufficiently at times to obtain some form of reply. He does not recognize the fact that he is in hospital, nor does he appreciate the identity of those around him. He appears to be living again through his recent experiences in the line, and interprets anything occurring near him from this point of view. Those near him are comrades in his unit, whom he addresses by name and talks to continually. Or they are German snipers, etc. Frequently he will sit up suddenly in bed and, with a terrified look on his face, shout "Look, look!" Then he will sink back in bed, moaning a friend's name. Any noise occurring near is thought to be bombs, shells, machine guns, etc., and is liable to bring on one of these brief outbursts. Towards the third or fourth day the patient's state of confusion has usually markedly decreased. He can then give some account of himself, his unit, and of what happened to him in the line. There is frequently, however, a complete blank in his memory, which may be partially filled later, but in not a few cases certain episodes in the recent memory have been permanently lost. At the end of ten days or so he will have improved so much that constant supervision on account of the 'wandering tendency' will no longer be necessary; whilst towards the end of the third week there will appear to be very little wrong with him. Subjectively, he may then complain of headache, dizziness, palpitation, irritability, a sense of undue fatigue, nightmares, or irregular sleep. Many tend to worry over the past amnesic state, or have a dread of mental disorder. At this stage patients were evacuated to the base, and their subsequent history is not known.

*Illustrative Case.*—Pte. C., age 19, boyish in appearance. The notes received from Capt. D. Bird, R.A.M.C., medical officer to his unit, stated: "He was sent to the regimental aid post for his strange behaviour. At first he answered questions by nodding or shaking his head. When given food he crumpled it up and dropped it on the floor, and when given a jug of water he poured it over himself. He is very restless, and will not sit in one place for more than a few minutes, then gets up and wanders round in a half-dressed condition. Temperature is normal, pulse 120, and tendon-jerks are exaggerated."

When he came under my observation a few hours later, he was highly excited and deeply confused. He had no idea where he was, and it was impossible to get any information from him. He was continually trying to get out of bed. A little later he became very emotional, weeping and shouting aloud, repeating anything he heard said. He was continually spitting about the floor. Next day he supplied one or two details about his home in Bradford, but could give no account of his recent experiences. Careful watch was still necessary to keep him in bed. He slept indifferently for the first three nights, but after that obtained almost twenty-four hours' continuous sleep. On the fifth day he was quite quiet and talking reasonably. Appetite good. Pulse 96. When evacuated to the base, he was still inclined to be emotional and was somewhat irresponsible in manner.

2. *The Longer Type.*—In these cases the depth and duration of the confusion seem to warrant their being grouped under the term 'acute confusional insanity'. At the end of two or three weeks the patients still showed signs of confusion, persistent hallucinations, ideas of persecution, etc. They had accordingly to be evacuated to the base as mental cases. On admission, the patient was usually in such a wildly excited condition that he required tying into bed. He would continue to struggle and shout for sometimes two to three days. He was, as a rule, suspicious, and presented a dangerous demeanour. His talk would be full of some real or supposed injury to himself. He would take no notice of questions, and his talk was all concerning the subject on his mind—e.g., "You are the one", "You are a German in disguise", "Will they shoot me?" etc. He would hear voices outside, and shout that everyone was plotting against him. Another patient would believe that the ward was an entrenched position, would picture machine guns here and there, and chatter about the fighting, calling out orders in a firm voice. This violent acute stage usually terminated towards the end of a week, leaving the patient in a somewhat apathetic condition, in which he lay in bed muttering to himself. His hallucinations and false ideas would still, however, be active, and frequently there was a brief recurrence of the excited state, followed by a temporary relapse into marked confusion. At the end of three weeks the patient usually presented a slow manner and a gloomy demeanour, with a marked tendency to be secretive and suspicious. When evacuated in this condition to the base, many cases were definitely delusional.

*Illustrative Case.*—Pte M., age about 21, of average physical development. The notes received from Capt. W. Power, R.A.M.C., stated: "This soldier was admitted to field ambulance in a restless and excited condition. His temperature was 99.4°. Next morning he appeared to be very nervous, and told me a long story about getting married. Three days later he suddenly began to be troublesome, and was continually wandering away from the ward. On the fifth day he was more excited, and stated that the ward orderly was impersonating him, and that his father was outside waiting for him. The slightest noise made him start, and look about in



a terrified manner. On another occasion he shouted out that he was Capt. Hamilton, and threatened to put certain persons under arrest. He was, however, never quite unmanageable".

On the tenth day he came under my observation. He was in a very terrified state of mind. His expression was staring and anxious. He talked rubbish in reply to questions. When left alone, he would lie for hours with his head covered up, muttering to himself. There was a slight general tremor of arms and legs. Restlessness was very marked, and a great difficulty was experienced in keeping him in bed. On the fourteenth day his condition had become much quieter. He still wanted "to get on with his journey to Deal", and required careful watching. Occasionally he had brief attacks of weeping, following which he would suddenly become quite cheerful and talkative. His appetite was very variable. He slept very lightly, and waked up frequently. On the eighteenth day his condition was as follows: Complaints of headaches. His attention is very poor, cerebration much slowed, and he still exhibits terror both in his appearance and behaviour. He stutters occasionally, and is continually asking to be allowed to go. The hands show a fine tremor. Pulse 120. Tendon-jerks much exaggerated. Pupils equal, and react sluggishly to light and accommodation. A few days later he managed to get away, and walked up to a post just behind the line. After being returned to hospital he continued to act in an irresponsible manner, until he was eventually evacuated to the base.

**TREATMENT.**—The patient must be kept in bed as long as his confusion lasts, and forcible means must be used, whenever necessary, to keep him quiet. Regular feeding, free movement of the bowels, and the early securing of sleep by every means in one's power, should be ensured. Putting the patient in a separate tent away from all other patients is advisable, if this can be done. In the first few days I found that immersion in a bath at a temperature of 103° to 105° for half an hour daily (or every twelve hours if necessary), followed by the administration of chloral hydrate and potassium bromide, or paraldehyde or veronal, has been a useful routine measure for quieting the excitement and inducing sleep. Whilst in the bath the patient's pulse should be watched. As a rule it has seldom been necessary to administer hyosine hydrobromide, and all soporific drugs are withheld as soon as the patient's state permits. Hot wet packs have not proved as beneficial as the immersion of the patient in a hot bath.

Much difficulty was experienced in feeding the cases in this group. They either took little or no interest in their food, or else refused it altogether. On the second or third day, therefore, forcible feeding was not infrequently called for. Alcohol, one need hardly say, should be absolutely avoided. It is possible that in some cases the confusional state had been accentuated by its use. I have notes of one case where an acutely delirious state followed shortly after the patient had been given "a stiff whisky in order to pull him together". This man was exceedingly violent on admission.



In the last stages, when confusion is passing off, I have found that a dose of potassium bromide occasionally at night has been effective in treating the minor sleep troubles.

### MISCELLANEOUS GROUP.

A few patients were admitted with varying degrees of confusion in whom eventually a diagnosis of definite mental disorder was established. Such conditions were: mental deficiency, dementia, general paralysis of the insane, acute mania, manie-depressive insanity, delusional insanity, and melancholia. One or two cases of dementia præcox and paranoia were also observed.

Three cases of an uncommon form of *mental torpor* were admitted, and deserve some description. At first they were regarded as being either hysterical or malingering, but close observation over a prolonged period sufficed to exclude both these conditions. The patient lay in an apathetic state in bed, with apparently complete suspension of all psychic functions. Depriving him of his meals produced no reaction. There was no incontinence of urine or feces. When spoken to, he evinced no interest, and either gave no answer at all, or muttered "I don't know". If given food, however, he took it in the ordinary way. Physical examination showed no noteworthy change from the normal state.

*Illustrative Case.*—Ptc. S., age 23, stolid, robust appearance. On admission, he presented a dazed, lethargic condition. He lay in bed with his face pressed against the pillow, and rarely changed his position. If rolled on to his back, he lay with his eyes closed, and made no resistance. After much persuasion he opened his eyes and glared round, with apparently no evidence of recognition in his expression. All questions and the ordinary means of rousing (shaking, etc.) produced no result: all psychic activity appeared to be suspended. After four or five days—during which time he had lain most of the time like a log—he began to look round a little. When asked how he felt, he stared hard at one for several seconds, and then answered in a low tone, "I feel better". He volunteered no conversation himself, accepted passively anything which happened, and had not appreciated the fact that he was in hospital. After eleven days he began to walk aimlessly up and down the ward, but took no notice of other patients, and never spoke to anyone. He was put for a few days on a pure milk diet, but this called for no protest. After taking him to a concert in the hope of rousing him, practically no change occurred in his condition. On the seventeenth day his condition was as follows: Strong frowning expression, which is persistent. Slight twitching movements of the orbiculares palpebrarum. Tongue tremulous. Attention is only obtained with the greatest difficulty, and goes again at once. He answers simple questions after a delay of several seconds. During the whole time he has been in the ward he has made no complaint of any kind, and no account of his history—recent or remote—has been obtained from him. His habitual attitude now is to sit with his head buried between his hands.

Physical signs of the nervous system show no evidence of organic disorder. Urine: sp. gr. 1020, acid reaction, no sugar, no albumin. This patient was evacuated to the base during the fourth week of his condition.

In another patient I found no improvement had occurred at the end of six weeks.

### CONCLUSIONS.

The states of confusion so intimately bound up with the earliest stages of the psychoneuroses have been found to be not infrequent in an Army centre dealing with these patients. The rough classification used in this paper has been adopted in order to lay stress on the fairly distinct grouping which was observed. The cases appeared to group themselves into three fairly distinct types: (1) Simple type with short confusional period; (2) Severe type with pronounced, but temporary, state of confusion; (3) Type associated with definite mental disorder. The majority of cases fell into *Group 1*.

The character and relative frequency of these confusional states deserve the consideration of all who are now engaged in the treatment of soldiers suffering from psychoneuroses. They serve to throw light on symptoms which otherwise appear unaccountable, and help to explain the instability which many patients still exhibit in an obstinate degree. It is only by an appreciation of the fact that many cases—which are now being treated for vague subjective symptoms, mild forms of mental incapacity, etc.—have undergone definite periods of confusion in the early stage of their disorder, that proper prognosis and treatment become possible.

## THE NATURE OF INSOMNIA IN THE PSYCHONEUROSES.

By R. G. GORDON, BATH.

OF all the symptoms met with in those who suffer from the psychoneuroses, one of the most troublesome, both to the patient and the physician, is that of insomnia. The long hours of wakefulness at night make more impression on the patient than any of his other symptoms, and unless relief can be brought in this respect the physician will find himself hampered at every turn.

In dealing with insomnia it is essential to get a clear idea as to what constitutes normal sleep: otherwise bad advice based on ill-conceived ideas may be given to the patient, with the result that his last state may be worse than his first. For example, it is common to hear a neurotic told to tire himself out and he will get sleep. Apart from the fact that in spite of extreme fatigue the patient often does not sleep, the person who gives this advice has not considered whether the sleep which is the result of fatigue is the same as natural sleep, or whether it is of the same benefit to the patient.

Much has been written on the subject of sleep, but no very satisfactory definition has yet been arrived at. It would seem to be the result of a withdrawal of vital energy from the higher levels of consciousness so that they no longer express themselves as conscious processes. The deeper the sleep, the more extensively is the content of what goes to make up the personality thrown out of action, so that in the deepest sleep only the vital reflexes persist, and of these we are seldom actively conscious. In lighter sleep, the intellectual, rational, and controlling levels of consciousness are in abeyance, but the innate impulses and the constellations of ideas repressed into the lower levels of consciousness find expression in the form of dreams.

How this withdrawal of energy takes place we do not know. Certain theories have been advanced, such as the theory of the retraction of the dendrites, but this sort of thing is necessarily purely speculative and therefore without much value. We can only accept the fact that there is such a withdrawal of energy from consciousness, and study the conditions under which it is brought about. It would seem permissible to recognize three distinct sets of conditions: (1) Sleep induced under the influence of drugs: (2) Sleep induced by fatigue; (3) Natural sleep.

All are agreed that the first is unsatisfactory sleep. It may be better than no sleep at all, but it is definitely the result of a poisoning of the central nervous system. The exhibition of these drugs is of course necessary; but the only healthy attitude towards them is that they are a reproach to therapeutics, and resemble in a certain measure the more primitive method of quietening the patient with a blow from a stout club.

So far as the second form of sleep is concerned, many people would say that we sleep when we are tired and because we are tired, and while this is undoubtedly true it is not the only reason or even the usual one: we must remember that fatigue may be either physical or mental. Pure physical fatigue, the result of excessive bodily exercise, undoubtedly induces sleep. Personal experience of bodily fatigue during the war has proved that to most of us. Sleep under such circumstances was not only possible but imperative, even under the most disturbing conditions. Sleep, then, follows physical fatigue, and it also follows mental fatigue. In considering mental work we have to reckon with its ideational and emotional sides. In practice these cannot be divorced, for the existence of completely feelingless thought has yet to be proved, and emotions cannot exist without ideas to which they attach themselves, although it is not necessary for these ideas to be conscious. The more highly toned with emotion a set of ideas may be, the more fatigue will be induced by its presence in consciousness. It is certainly more tiring to attend to a highly dramatic play or listen to emotional music than to add up columns of figures; and, as has been said, if too much work of this description is performed sleep will result: but this type of sleep would appear to be due also to a poisoning of the central nervous system, not by exogenous poisons, but by the endogenous products of fatigue which result from the metabolism of the cells of the nervous and muscular systems.

When we come to deal with natural sleep we must recognize that this is not the result of fatigue, but a protection against fatigue: that is, that it is not the result of harmful influences, but a biological protective reaction essential to the well-being of the individual. Boris Sidis, in his *Experimental Study of Sleep*, shows clearly how sleep saves the organism from fatigue, and Bruce<sup>1</sup> has amplified his conclusions that natural sleep is induced by monotony. The latter has pointed out that the more varied the mental equipment an individual possesses—that is, the greater the intellectual capacity which he enjoys—the less sleep he takes and the less he needs. The converse of this is quite obvious, for both young children and mental deficients, whose intellectual outlook is narrow and consequently monotonous, require and take a large amount of sleep. The same seeking after monotony

is obvious in the steps which the ordinary person takes when he goes to bed. First he takes care to avoid physical distractions which might alliet him through his common sensations. This he achieves by lying in a comfortable bed, obtaining an equitable temperature by adequate covering, and a pure atmosphere by adequate ventilation. Next he avoids extraneous mental distractions which might alliet him through his special senses, more especially of sight and hearing, by excluding light and sound. Finally, he completes the monotonous restriction of his consciousness by not paying attention to any intrinsic thoughts which enter his mind. There is good reason to consider attention as the conative aspect of the libido or general vital energy, and therefore this deflection of attention from the stream of consciousness corresponds to the conception of sleep, as a withdrawal of libido from the higher levels of consciousness. It is this question of the cutting off of the attention preparatory to sleep which concerns us in dealing with the insomnia of the neurotic. Assuming that the theory of the psychogenic origin of the neuroses is correct, we may describe the condition as the outcome of a mental conflict within the personality. Such a conflict may refer to the past, present, or future, but in most cases it is associated with the memory of a particular event of extreme emotional intensity, though this event in turn may be only symbolic of a tendency which the patient recognizes in himself, but regards with distaste, and so refuses to admit even to himself that it exists in his mental make-up. The emotion involved may vary, but is always unpleasant—fear, anger, disgust, and the like, with their derivatives remorse, despair, etc. Owing to the presence of this intense unpleasant emotion, the ideas to which it is attached become insupportable to consciousness, and consequently must be got rid of or repressed. The way in which this repression is brought about throws light on the question of insomnia. At first there is an effort to banish the complex which is generally perfectly conscious in the beginning, though rarely it may be below the threshold of consciousness from the first. The patient gives his attention to keeping the offending material out of his mind. He avoids discussing it, he avoids reading anything which may remind him of it, and tries to cut it off from all other associations in his mind. This effort of attention is the first step towards the formation of a barrier which will repress the complex. The greater the intensity of emotion associated with the complex, the more dynamic will it be, and the more vigorously will it strive to express itself in consciousness. Hence the strength of the barrier, and the degree of attentive power necessary to establish it, will depend directly on the intensity of the emotion. The repression of a complex of low emotional tone, therefore, will not appreciably interfere with the attentive power of the subject, but



the repression of one of high emotional tone will seriously deplete his attentive capabilities, and that is what happens in the neurotic. As time goes on, the attentive effort becomes a habitude, and the patient ceases to be aware either of the complex or the effort, yet the effort is still being made. In this way the complex is repressed and becomes unconscious. However, if the barrier requires strong attentive effort, certain symptoms will arise.

For the purpose of this article, the symptoms of incomplete repression, such as obsessions, somnambulisms, and the like, which result from emotional or ideational parts of the complex escaping into consciousness, divorced from their proper setting, need not concern us. We are concerned rather with the symptoms arising from the imposition of the barrier, which occurs whether the repression is complete or not. In such cases we find that during waking periods the patient's power of attention is markedly deficient, for, if our theory is correct, most of the available attentive power is utilized in forming the barrier. It is when the patient tries to go to sleep, however, that this chaining up of his attention comes most into play. It was stated above that, in order to achieve normal sleep, all effort of attention must be relaxed, whether that effort is conscious or almost completely unconscious. In the case under discussion, however, this cannot be done, for, if the effort of attention is relaxed, then the complex will find expression in consciousness and disturb the monotony necessary for sleep. Besides this, the patient is automatically aware that such an event is intolerable, and is therefore unconsciously afraid to allow his vital energy to be withdrawn from the higher levels which intervene and protect him from his dreaded complex. Consequently he becomes more alert than ever, and gives his attention to any and every image which enters the field of consciousness, and, as he expresses it, the more he tries to sleep the wider awake he seems to get. As time goes on, however, fatigue ensues, and this induces the second variety of sleep mentioned above. Directly he loses consciousness, that is, directly the vital energy is withdrawn from the higher levels of consciousness, the barrier is partially but not entirely relaxed, and the complex can find expression in consciousness in the form of a dream. If this has sufficient emotional power it will burst right through the barrier, and express itself directly, as, for example, in the form of a war nightmare in which the patient actually goes through, in the dream, experiences typical of what he is so anxious to repress during his waking life. If, however, the barrier is still of sufficient relative strength to prevent this direct break through, the dream will only be able to express itself in consciousness in a disguised form. The mechanism of these disguises need not be discussed here; but the essence of them is that since the repressed material cannot express

itself as it is, it finds expression through more or less direct associations which are symbolic to the patient of the ideas which are being repressed. For example, suppose A represents a repressed idea and the associations to A are A-B-C-D-E, etc.; where the barrier is relatively weak, a direct association B or C may be expressed in consciousness as a dream image; but if the barrier is strong, then it is not until the associative chain has reached E or F that the barrier can be penetrated or circumvented, so that the dream image F, though connected with the repressed idea A, may differ from it very materially. The further the associated dream image is from the repressed idea, the less emotional intensity will it have and the less will it disturb the patient. The function of the barrier is to keep the patient asleep if possible, and in health this is successful; but when the repressed material is sufficiently strong to cause a neurosis, it usually finds conscious expression during sleep sufficiently directly to wake the patient. He then immediately reimposes the barrier, and sleep is once more denied him until a sufficient degree of fatigue ensues to make sleep imperative, and so the process goes on all through the night.

The degree to which the barrier retains its power during sleep depends, of course, upon the intensity of the underlying emotion, but also on the degree to which the attentive effort has become automatic and therefore unconscious. In such cases it would appear possible for the patient to fall asleep fairly readily at the first attempt, only to be awakened later by dreams. Then, the whole process being raised nearer the threshold of consciousness, the sequence described above is carried out, and he has great difficulty in again going to sleep.

Such, then, is the nature of the most important form of insomnia met with amongst neurotics, but we have also to recognize a simpler variety. This consists of a hysterical habit-continuation of insomnia: an auto-suggestion simply involving the idea that sleep is impossible. In such cases the patient has had a period during which he was bereft of sleep as a result of pain or other disturbances. However, after the removal of this cause he has persuaded himself that he cannot sleep, and does not succeed in inducing the requisite degree of monotony to procure natural sleep. This does not imply that sleep is normally induced by a conscious effort, though certain observers have declared that sleep is all a matter of 'will'. It must be remembered that suggestion may prevent an automatic process just as readily as it prevents a conscious process. In this habit-insomnia the patient has no particularly disturbing dreams, and once he does go to sleep he generally sleeps soundly and well; it is simply a matter of not getting off to sleep. In this latter condition any treatment which will break the habit is successful, and in such cases

a course of some drug, cautiously administered and gradually withdrawn, is often very successful; but by far the best remedy, in my experience, is hypnosis. As a rule a suggestion of sleep given two or three times under hypnosis is sufficient, especially if this can be done in the evening, so that the patient can be hypnotized and left asleep.

In the form of insomnia due to emotional conflict, however, the matter is not so easily dealt with either by drugs or by pure suggestion. The former are seldom successful, but admittedly hypnosis is sometimes useful, though, in my experience, the result is apt to be only temporary. In any case, all that hypnosis can do is to strengthen the barrier, thus damping down the volcanic fires that smoulder underneath. As has been said, this may succeed, but blocking the crater of a volcano is of doubtful expedience, and the better course is for it to expend itself and to be finished with for good and all. This is done by reintroducing the complex to consciousness and getting the patient to face it and adapt himself to it and all that it may represent, so that it may be no longer repressed, thus doing away with the barrier and freeing the attention for more useful purposes. In almost every case the idea has been intolerable because the patient has not been able to regard it from more than one aspect. On being shown other aspects and led to look at it from other view-points, he finds that after all it was not such a terrible bogey as he thought. He finds that the experience may even be of use to him instead of a hindrance, or at least there is no reason why it should hang like a millstone round his neck. The methods of solving the conflict of the neurotic are not within the scope of this paper, which only seeks to show why he does not sleep; but presuming that the conflict is removed, the barrier is no longer necessary, and he can once more achieve that monotony which is essential to normal sleep, while at the same time he finds that his other symptoms disappear and his sense of well-being is restored.

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<sup>1</sup>BRUCE, *Sleep and Sleeplessness*, 1916.

## Short Notes and Clinical Cases.

### A CASE OF TORSION-DYSTONIA, OR TORSION-SPASM.

By M. A. BLANDY, London.

It is only in the last ten or twelve years that the disease known as torsion-spasm or torsion-dystonia (*dystonia musculorum deformans*) has been differentiated. Some forty cases are already on record, most of which have been reported either in Germany or in America. Of the total number, only five have occurred in non-Jewish families. As far as I am aware, the following case is the first of this curious condition to be observed in England. For that reason, and because of the desirability of directing attention to a little-known disease of somewhat serious import, it appears worthy of being recorded.

**Clinical History.**—H. R., male, age 8, was an in-patient at the National Hospital, Queen Square, London, under the care of Dr. James Collier, from February to June, 1920.

The mother was healthy, with no history of miscarriages, or of a similar complaint in her family: the father had 'bronchial asthma and a wasted lung', and his sister had chorea after rheumatic fever. His grandmother, mother, aunt, and two uncles all had enlarged thyroids, though they were London-bred. The aunt eventually died of Graves' disease, of which none of the others had symptoms. No Jewish or Polish descent could be traced on either side of the family.

The patient, the eldest of three, of whom the third, a boy of four, was said to have a weak heart, was a full-term child by normal labour. He was breast-fed for nine months, and began to walk and talk at eleven months. Shortly before his fourth birthday he suffered from diphtheria, and when about five years old he stopped growing.

He was a bright and normal child until six months after the attack of diphtheria, when his mother noticed he used to throw out his right arm away from his side, as though, she thought, he were trying to urge his jersey up his arm to make it comfortable. A week or two later 'the use went out of his hands', while the involuntary movements ceased. Electrical treatment was given them for six months without much improvement. Twelve months later involun-

tary movements of the tongue and head started, described by his mother as 'throwing his tongue out and his head about'.

In May, 1918, he had an attack of measles; he was treated at home and was noticed to use his hands again for a week after he got up, but 'lost the use' once more, i.e., did not use them properly. In June, 1918, he was admitted to the National Hospital, but was discharged two days later with a rash erroneously supposed at that time to be measles. However, it was subsequently learned that the boy had had a rash on his back at intervals since the age of four or five, which still continued. Jerking movements of the trunk on the legs were first observed in February, 1919, and led to his admission to St. George's Hospital under the care of Dr. James Collier. The notes then taken specify the perverse movements of the hands, the protrusion of the tongue, rotation and extension of the head, and, when he lay on his back, the involvement of the trunk muscles. During and after meals the movements were worse. While in the hospital he developed a follicular rash, culminating in pustule-formation and attended by slight rise of temperature and increase in pulse-rate, of four days' duration. The hand and face movements were said to have improved, whereas the trunk movements became more severe.

Three weeks after his discharge his mother said he began to jerk his tongue in and out, so that food was thrown out of his mouth, while the movements of his hands made it impossible for him to feed himself. This state of affairs obtained until five weeks before admission to the National Hospital, when he was knocked down by a bicycle. On being picked up he was quite stiff, with legs extended, arms stretched down, and back arched; he was not unconscious, as he spoke to his mother, yet each time he was set on his feet to walk he fell down, and he remained off his feet for three days. During this time the movements became very violent, and they continued so up to the date of admission. Feeding became extremely difficult: his food was placed in the right side of his mouth, since it thus appeared to be more easily swallowed, but solids had to be cut up into small portions, and only a few drops of fluid could be taken, the rest being spilled out of his mouth.

For three weeks before admission there had been great difficulty in starting the act of defaecation: he would stand up for some time before passing anything, and, when asked why, replied, "I can't help it". The bowels were usually constipated.

Attention and excitement aggravated the involuntary movements, which were always worse in bed, preventing him from getting to sleep. To accomplish this he commonly turned on his face and put his right hand behind him. When on his feet he often tucked his left hand behind his back.



The child had never been to school, but he knew his A B C, could count, and was mentally quick and alert. Naturally of a happy disposition, he had shown occasional bad temper since the accident, shrieking and stamping his feet.

**State on Admission.** The boy was distinctly small for his age, with a dolichocephalic head (circumference 21 in.), which appeared large in proportion to the smallness and thinness of his body. The joints were normal, and no lordosis was seen in the position of rest. A pale and sallow child, with adenoid facies, towards the end of his stay in hospital he became slightly yellowed as with cachexia, but no jaundice was ever present, nor was pigmentation of the corneo-scleral junction found. His skin was subject to frequent crops of punctate erythema and papillitis, and in addition there were occasional pustules on the upper trunk. The cervical lymph-nodes were enlarged, and those of the axillæ and groins palpable but not enlarged. His teeth were bad and the gums unhealthy. A high-arched palate and small cryptic tonsils were accessory to the presence of adenoids, though the boy was a nose-breather.

The area of hepatic dullness was slightly diminished and the liver edge impalpable; nor was the spleen enlarged, though complaint was occasionally made of pain in that region. Cardiac and respiratory systems were normal. The boy ate largely, and frequently complained of thirst. It was always an effort for him to evacuate the bowels, in spite of regular aperients for the constipation; it took sometimes as long as twenty minutes to accomplish the act, the child standing throughout. With micturition he appeared to have no difficulty. The urine was normal, but concentrated owing to the loss of fluids from his system by way of the skin, as he sweated profusely during the intense muscular exertions of his malady. No rise of temperature occurred during his stay in hospital.

Mentally the patient was intelligent, perhaps rather in keeping with his size than his years, but this was attributable to his lack of school education and to his home environment. At times obviously dazed by physical exhaustion, he was otherwise bright, amiable, obedient, emotionally normal, and an excellent witness.

In his speech, which was normal except for the pronunciation of 'th' and 'm', he paid no attention to his convulsed condition, but carried on a conversation in a detached manner, despite the fact of his words and phrases being punctuated with deep silences due to involvement of the muscles of respiration in the spasms.

The cranial nerves were normal, the optic discs clear; sensibility was unimpaired. Tendon-reflexes were normal, or possibly slightly diminished; the abdominals were active and the plantars invariably flexor.

The muscular system was of normal development on admission, but some hypertrophy of those muscles most in action appeared before discharge. During the intervals of relaxation a considerable degree of hypotonia was present, especially in the upper limbs; the wrists, e.g., could be bent into almost any position; tonelessness of the abdominal wall showed itself in a rather prominent abdomen, and of the legs in a mild degree of genu recurvatum. Tremor and ataxia were conspicuous by their absence. Power was fair and equal on the two sides: the finer movements of the hands were awkward and slow. He would pick up a penny, either between the backs of the proximal phalanges of the first two fingers of either hand, or awkwardly between thumb and middle finger: as a general rule his hands maintained the attitude of flattened fists, out of which he would cautiously protrude the middle finger to execute any little act.

Any voluntary movement he was asked to perform he would cleverly insert in the brief intervals between his contortions, and he would obviously wait for the moment of relief and deftly snatch it when it came. For varying intervals of time, generally when interested in something, he would assume an almost natural posture, whereas at his worst he could not carry out any act requiring more than a moment of time, being wrested remorselessly from it as though impelled by an invisible power.

In general, the involuntary movements were of a clonico-tonic, tie-like character: they were clown-like, grotesque, bizarre, the most remarkable feature being the extreme lordosis and twisting of the spine. With the course of the disease the tonic element became more, and the clonic element less, pronounced. At first they were comparatively slight (*Fig. 1*), but they steadily became more severe. The full maturity of the spasm, attained during the last three weeks of his stay in hospital, was as follows (*Figs. 2, 3*). A sudden violent extension of the head pulled it back and to the left, so that the occiput touched the back of the left shoulder, at the same time as the tongue was hyperprotruded a little to the left of the mid-line and the eyes conjugately deviated to the right and down, the patient as far as



FIG. 1.—February, 1920. Mild stage. Note extension and pronation (torsion), especially of left arm.

possible still looking forwards; the lids closed towards the end of this movement, the forehead wrinkled, and the left jaw and left facial muscles contracted. The head then described a rotatory course across the shoulders to the right, maintained this attitude for a few seconds, then as it returned to the mid-position the shoulders were thrown back, the whole trunk taking on an acute lordosis, with scoliosis to the left in its upper part, the right arm extended at shoulder and elbow, overpronated at wrist, with fingers and thumb flexed into a flattened fist, or occasionally extended. The left arm



FIG. 2.—June, 1926. Moderately severe stage. Note how arm is thrown behind back.



FIG. 3.—June, 1920. Note torsion of right arm.

was almost invariably carried behind the child's back, i.e., extended at shoulder, flexed at elbow, pronated and partly extended at wrist, with fingers in a fist as on the opposite side. During the intermissions he habitually walked about with his left arm in this attitude.

The respiratory muscles were implicated in the spasm intermittently, without dissociation, and the abdominals were affected simultaneously with the overacting erector spinae, against which they were powerless; the contraction, nevertheless, was visible, and frequently affected one quadrant more than another.

Occasionally the flexors of the hip acted synchronously with the

lordosis-producing group, the whole effect, as may be imagined, being grotesque. If the child were seated with feet off the ground, his lower limbs took part in the general spasm, being abducted and extended, the left more than the right, the toes pointing down and the feet a little inverted. When he stood the legs were not involved, and he admitted he always felt easier thus.

With observation or any attempt at passive restraint, even as slight as that of putting him to bed, the movements increased; once he was off to sleep they stopped. His gait was normal, and if occasionally interrupted by a spasm it never threw him down.

If allowed to try to feed himself he spent time and effort with poor success; he filthied himself and everything around him, as a spasm would overcome him when he had a spoonful in his hand, and it would be flung freely in any direction. He was fed with difficulty between the spasms, with minced food or slops, since he was unable to masticate.

The cerebrospinal fluid was in all respects normal, and the Wassermann tests were negative.

**Remarks.**—There is no doubt that this is a case of torsion-dystonia. The extreme lordotic, spine-twisting, clownish contortions are identical with those described by Mendel in his monograph (see this Journal, No. 1, p. 86). The variations in muscle tone, the absence of pyramidal involvement and of intellectual impairment, the progressive nature of the affection, are typical of the disease in question. That the face has not escaped does not refute the diagnosis, since in several of the recorded cases 'grimacing' has been observed. Five cases have been noted in Gentiles, although the condition is, like Tay-Sachs' disease, ordinarily confined to Polish Jews, and the case now reported constitutes a sixth.

The attitudes of the trunk and head in extension, and the extremely frequent, though transient, postural fixation of the arms in extension and hyperpronation (*see Figs. 1, 3*), are, it is interesting to note, the same as those described by Dr. Kimmier Wilson, in his paper on decerebrate rigidity in man, as obtaining when the cortex is in functional abeyance and cerebello-mesencephalo-spinal centres come into involuntary action.

One glance at the patient is sufficient to dispose of a diagnosis of hysteria or of convulsive tic. That there is some causal toxic agent at work, probably of alimentary origin, may be inferred by the fact that very shortly after the onset of the first symptoms the child stopped growing, and developed an intermittent rash of toxic character, enlarged lymph-nodes, and sallow appearance.

The only autopsy as yet described in the literature was made

by Thomalla (see this Journal, No. 1, p. 87), who found cirrhosis of the liver and bilateral softening of the putamen. Mendel considers Thomalla's case to belong definitely to progressive lenticular degeneration or to pseudosclerosis, and not to torsion-spasm. From physiological considerations, however, it seems clear that the pathogenesis of the involuntary movements in the latter is to be ascribed to release of non-cortical motor activity whose anatomical seat is in the mesencephalo-spinal centres already alluded to.



FIG. 4.—August, 1920. Severe stage.



FIG. 5.—August, 1920. Severe stage. Note extreme extension of right leg on trunk. The right foot is visible beyond thorax.

My thanks are due to Dr. James Collier for his kindness in allowing me to publish the case, which is under his care, and for giving me access to all notes in his possession. I also wish to thank Dr. Kimmier Wilson for acquainting me with the disease, and for his unfailing help and inspiration.

#### ADDENDUM (*July 30, 1920*).

The patient has to-day been re-admitted. His mother reports that he has become much worse. He is unable to rest in bed, and



for the last week has tried without success to sleep standing upright, as this attitude is the only one that stabilizes the movements.

On examination the child is seen to be utterly exhausted physically, but is still intelligent and obedient. While the face movements are now scarcely in evidence, lordosis is too mild a term to apply to the violent opisthotonic convulsions that rack his frame. They are infinitely worse when lying down. Photographs of him in bed are appended, and they need no description (*Figs. 4, 5*).

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## Critical Review.

### EPILEPSY.

By W. ALDREN TURNER, LONDON.

THE approach to the study of epilepsy has been made by various routes—clinical, experimental, pathological, and biochemical. Most recently it has been viewed from the psychological standpoint. Much has been written as to whether epilepsy is based upon an organic foundation or is a functional disorder. It is generally recognized that some cases are symptomatic of an organic lesion of the brain—vascular, traumatic, or neoplastic; others are of toxic origin—alcoholic, eclamptic; others are of infective nature; others are associated with degenerative cardiovascular disease. When all cases of symptomatic epilepsy have been put aside, a large residuum remains belonging to the so-called *idiopathic* group. This division of the epilepsies, it would appear, may be reduced by the recognition of a psychological series.

In the two works referred to in this review, the attempt has been made, on the one hand (Redlich<sup>1</sup>) to produce evidence of the essentially organic nature of all epilepsy; and on the other (Clark<sup>2</sup>) to prove the existence of a definite group of the epilepsies arising from psychogenic causes. It is the object of the reviewer to lay before the reader such salient facts as may be necessary to inform him of the present-day position of the epilepsies as revealed by the study of the works of Redlich and Pierce Clark respectively.

I. Redlich may be regarded as a protagonist of the organic nature of epilepsy. His work is a detailed and elaborate study in which is brought forward all the published evidence that goes to prove the organic character of this disease. It might perhaps be desirable to state his general conclusion before referring in some detail to the evidence on which it is based. He says it is difficult to classify epilepsy as a pure neurosis in view of the picture presented of its chronic course, its severe fits, and its symptoms both in the somatic and psychical spheres. He places chronic epilepsy amongst anatomico-pathological disorders, and calls attention to the diffuse changes which are found in the brain both in the so-called genuine disease and in the

obviously organic forms as evidence of the 'oneness' of these disorders. In his view the term 'genuine epilepsy' should be allowed to lapse, because from all sides it is impossible to define with certainty a group to which this term may legitimately be applied.

Much divergence of opinion has existed as to what should be regarded as genuine epilepsy. Reynolds held as genuine only those cases which occurred without structural changes in the brain and without disease of other organs; Binswanger only those chronic cases with a predisposition or congenital epileptic constitution; Gruhlé only those in which the etiology was uncertain; Gelineau only those in whom no cause could be found. It is generally agreed, however, that a chronic course and a tendency towards permanent psychical changes are essential for the diagnosis of genuine epilepsy.

We are confronted with the same difficulty if the time of onset is taken as a basis, for it is often difficult to determine the time at which the epilepsy commences. A large number of cases of chronic epilepsy begin in early life. A few fits may occur in childhood and then remit, to return at puberty or even as a late epilepsy. Other cases begin in an infantile eclampsia, sometimes associated with infective causes, but do not always go on to a chronic epilepsy. Some infantile convulsions are due to encephalitis, which may give rise to epilepsy later in life.

A like difficulty arises over the late epilepsies. Quite a number of these cases have a direct heredity to epilepsy; others may have had convulsions in infancy or a few fits about puberty, which cease until arteriosclerotic changes favour their recurrence in permanent form. The late epilepsies are more often associated with organic lesions of the brain and nervous system than the early epilepsies, but etiologically it is not right to separate the late from the so-called genuine variety, as there are late epilepsies without anatomical lesions just as there are early epilepsies with them.

If we turn to the exciting causes of epilepsy we find a large number of cases presenting infective, toxic, traumatic, neoplastic, and other agencies at work in the production of the disease. The influence of acute infective disease, especially scarlet fever, in the causation of epilepsy is well known. This disease may originate an epilepsy through toxic agencies or by the production of organic lesions of an encephalomeningeal character. Syphilitic infections also may lead to a neurosyphilitic variety of epilepsy, sometimes of toxic origin, at other times of meningeal or vascular origin. Redlich holds that all forms of neurosyphilis offer great possibilities for epilepsy in view of the many organic lesions which occur in the brain in consequence of this infection. The effect of pregnancy and the puerperium upon epilepsy is important. Epilepsy may be latent during a pregnancy,

The development of epilepsy out of a puerperal eclampsia has long been recognized. It has been thought that in this type of the disease a toxi-infective cause is at work. On the other hand a 'pregnancy epilepsy' may temporarily subside, but recur and eventually become a chronic epilepsy of the menstrual type. It is suggested that in the 'menstrual type' of epilepsy, which is common at the outset of many cases of chronic epilepsy, a chemical influence is at work through the agency of ovarian hormones.

The relations between epilepsy and endocrine function are uncertain. Redlich maintains that the organs of internal secretion play a not unimportant part in the production of epileptic seizures. The association between hyperthyroidism and epilepsy in young women is not unusual, but whether as cause and effect is not clear. The relation between epilepsy and tumour of the pituitary body also is not uncommon. Here the epilepsy may be the first symptom, or the symptoms of pituitary tumour may ensue during the course of a chronic epilepsy. Reference also is made to the action of the parathyroids in tetany and epilepsy. The whole subject, however, of the influence of endocrine secretion—normal or abnormal—requires fuller investigation in its relation to epilepsy.

If we turn now to symptomatology, it is argued that there is no essential difference between the fits of organic epilepsy and those of the so-called genuine disease in their clinical expressions. An organic lesion of the cerebral cortex gives rise usually to fits of the focal or Jacksonian type: but, if the lesion is subcortical in position, although one side of the body may be affected in excess of the other, the fit itself may have the common features of an epileptic seizure. It is recognized as an accepted principle that the seizures occurring, for example, in a case of cerebral tumour involving the frontal or the temporosphenoidal lobes may have all those features common to the reactions of genuine epilepsy, such as various forms of minor epileptic attacks, twitchings and spasms of head and eyes, limbs, or body, psychical attacks and general convulsions, with or without warning.

Typical epileptic fits with post-convulsive psychoses may run a chronic course for many years before localizing or general symptoms of intracranial tumour make their appearance. There may be, indeed, single features by which the fits of genuine epilepsy may be differentiated from those of organic epilepsy, but they are of a secondary nature. The post-convulsive paralyses are not constant, nor are they entirely characteristic, and the Babinski plantar response may be obtained temporarily after a severe fit, or may persist for a time after status epilepticus or the status hemi-epilepticus. Redlich admits that post-convulsive signs are not common in genuine epilepsy and are often only of the slightest character. They are more common

after frequent and severe fits, and indicate the summation of 'exhaustion' symptoms. In his view these sequelæ are associated with histological changes in the brain, and their persistence indicates an increase in these changes, probably of the nature of a gliosis.

He argues also that transitional forms may be found in a study of epilepsy with infantile cerebral paralysis. Thus a latent infantile cerebral palsy may be made manifest by a fit. The only means by which these seizures may be distinguished from those of genuine epilepsy is by their more unilateral character. The lesion may be focal or diffuse, cortical or subcortical. The original palsy may have disappeared, the history alone denoting its previous existence, although, if the lesion was in the left hemisphere, left-handedness may be present.

In like fashion the existence of psychical symptoms in epilepsy and of psychical epileptic equivalents offers no argument against the organic nature of this disease, as they are observed in cases of epilepsy associated with tumor cerebri, meningitis, and multiple sclerosis. A large number of cases of chronic epilepsy show some degree of mental enfeeblement or dementia, which is to some extent dependent upon the frequency, severity, and quality of the fits. According to Redlich, this characteristic epileptic dementia is based upon extensive anatomico-pathological changes in the brain. The organic epilepsies of early childhood may be associated with a profound degree of feeble-mindedness often bordering on imbecility, which may be further augmented by the attacks. On these grounds it would seem to be impossible to draw a distinction between the so-called genuine epilepsy and that associated with infantile cerebral paralysis.

Pathological lesions of all kinds abound in cases of epilepsy with or without infantile cerebral palsy. Such are cysts, cystic collections of fluid in the meninges, thickening of the meninges, varicosity of certain veins, diffuse sclerotic and meningeal changes following acute infective diseases and hydrocephalus.

In view of such organic findings, may not the so-called genuine epilepsy have a pathological basis? Sclerosis of the cornu Ammonis is found in from 30 to 60 per cent of all cases of epilepsy, and a 'Randgliose' is not infrequent. Morbid changes in the brain of an acute character have been observed and studied in consequence of severe fits and the status epilepticus. Redlich regards these changes less as due to the fits than as the anatomical correlation of the process which evokes the fits.

Taking all these facts into consideration, Redlich concludes that it is difficult to regard epilepsy as a pure neurosis. He believes that the pathological changes which are found in the organic epilepsies and in the so-called genuine disease are evidence of the 'oneness' of these disorders.



II. In *Clinical Studies* Pierce Clark has elaborated in great detail the psychogenic attitude towards a group of epilepsies. I recommend the study of Clark's work on this subject to those who are interested especially in the psychological investigation of epilepsy. One feature stands out with notable prominence, viz., the value of a meticulous examination of the psychological history and temperamental make-up of the epileptic, both actual and potential.

As the *Psychiatric Bulletin* is not obtainable in our medical libraries, I shall give a précis of this work in order to bring before the reader the main facts bearing upon the psychogenic origin of epilepsy.

The psychological study of idiopathic epilepsy includes the recognition of the temperamental make-up of the epileptic, and the analysis of the mental content accompanying the convulsive or other characteristic reaction. It is held that the temperament in epilepsies is important, as it is this quality of mind which determines the adaptational failure and the development of the seizures or other equivalent reactions of epilepsy.

This temperament may be stated briefly to be characterized by egotism, morbid sensitiveness, and poverty of ideas. Epileptics invariably are self-opinionated, conceited, and self-assured. They are often moody, with periods of lethargy, alternating with outbursts of hastiness. They are difficult to live with. They adapt themselves badly to social conditions, become self-centred, morbid, and asocial.

In consequence of these defects the epileptic is incapable of social adaptation and is rendered inadequate to lead a normal adult life. This temperamental condition may be studied even in childhood, and may be well marked many years antecedent to the onset of the fits. Long before the attacks of epilepsy develop, other signs of maladaptation may be observed in day-dreams, outbursts of temper, irascibility, and depressive phases.

Thus it comes about that when the new and elaborate adaptations required at puberty and adolescence have to be met, the temperamental deficiencies are such that failure occurs, and characteristic reactions are the direct outcome of the inability of the subject to subordinate individualistic tendencies to social demands.

Pierce Clark maintains that the epileptic seizure is a reaction away from stressful reality, and may serve some useful purpose by enabling the patient to escape from responsibility or avoid some necessity for adaptation.

The reactions are not always similar. There are the common forms of petit mal as well as the major epileptic seizure, and there are the various epileptic equivalent reactions, such as abstractions, lethargies, outbursts of uncontrollable excitement and temper, depression, mania, and the like.

A mental exploration or psychological analysis of epileptics may bring to the surface all kinds of mental conflicts and repressions, which favour the onset of the epileptic reactions in consequence of the inability on the part of the patient to adjust his outlook to particular circumstances, such as periods of stress or disappointment.

The nature of the stress may vary. It may be an inability to adapt to school or college work or to the disappointments of a business career. It may be fatigue or physical strain. It may be of the nature of a mental conflict, with associated repressions. If the subject can be kept free of irritation, under moderate adjustments of work, he may continue free of attacks. Indeed, the actual convulsive seizure may be only the most severe reaction in a whole series of maladjustments. Thus a careful daily study of the epileptic may show great variability in the mental state; a period of irritability may be followed by one of spontaneous interest; a phase of cheerfulness may be succeeded by one in which 'nothing is right'; upon these a major epileptic fit may supervene, to be followed by a spell of relief and quietness. It is well known that irritability and fault-finding lasting for a day or two may be succeeded by a convulsive seizure at night which 'clears the air' for a while.

It is held that the real motivation of the fit may be unconscious, while that which would appear to be sufficient may not be followed by an attack. It would appear also that the ordinary immediate stimulus of the fit is not the irritation itself, but the effort of repression not to respond to the irritative stress which the patient feels and which, if allowed expression, might be violent and excessive.

It is well known that parents who suppress the 'tantrums' of an epileptic child find that such suppression may provoke more frequent and severe fits. Repression may increase nervous tension to the point that a convulsive reaction may be the means of temporarily withdrawing the person from a too demanding environment. It may be assumed that the disorder in genuine epilepsy has to do with adjustments at deep instinctive levels of the nervous system, and that the fit as a reaction to failure may be so severe as to threaten even life itself.

It is obviously impossible to conduct a psychological analysis during the period of unconsciousness, but an examination of this character may be made during the milder types of seizure, in the transitory confusion accompanying minor attacks, and in the post-convulsive dream states of the major attack. A study also of the epileptic deliria and the spontaneous remarks which are made by patients in these conditions, if noted and analyzed, may throw light upon the mental conflict underlying a particular epileptic reaction.

Usually three sets of psychic events have to be noted. First, the remote and immediate stresses which aggravate and promote the

occurrence of individual epileptic reactions: secondly, the actual mental content of the specific attack: and thirdly, the early and ultimate free association upon the essential words or ideas expressed in the content.

Epileptics may be divided into those whose adaptational disability is slight—the high-grade type—and those who are badly adapted, or the chronic type. Amongst the former we find those patients in whom a cure results and in whom efficient treatment may bring about a strengthening of their adaptive power: in the latter, whose temperamental defects are pronounced, a steadily progressive epilepsy develops. The social position of the confirmed epileptic is unsatisfactory, and unfavourable for adaptation. They become the victims of social repression which tends to aggravate the disability. Hence the chronic epileptic loses spontaneity and contact with the world: he becomes apathetic, dull, and anergic. He has, in fact, passed into the condition of permanent renunciation to efficient adjustments to reality, viz., epileptic dementia.

Clark makes some important remarks upon the treatment of epilepsy. He holds that a rational therapy can be based only upon a careful effort to understand the make-up and the mental mechanism in this disorder. Attention must not be restricted to the occurrence of individual seizures. Children predisposed should be taught how to approach the difficulties of a situation. It may be necessary in the young to omit the intellectual side of training and to tutor the patient entirely in social behaviour. The discipline and training at the average school often furnish just that degree of stress which is too much for the epileptic. Hence educative training should be entirely individualistic and elastic. The epileptic requires novelty and wide range of educational appeal, and every effort should be made to adapt the patient along ethical, moral, and social lines. His training and treatment are often carried out best away from home. Special attention and study should be given to his emotional and intellectual interests, and it is necessary to combat the temperamental antisocial tendencies.

Redlich accepts the theory, which has been held for many years by a number of workers upon this subject, that epilepsy is an organic disorder. This view has received support from the unsatisfactory results of treatment, from the large number of epileptics who become victims of chronic epilepsy, and from the progressive character of both the paroxysmal and the interparoxysmal symptoms. It has been confirmed by the acknowledged existence of pathological changes in the brain, although a doubt has been expressed as to whether these changes are the cause or the consequence of the seizures.

According to the psychogenic theory of epilepsy, the seizures and other paroxysmal phenomena are reactions away from stressful reality, and serve a useful purpose by enabling the patient to avoid some necessity for adaptation. The chronic disease denotes well-marked temperamental defects with persistent adaptational failure; while the dementia is due to the crippling effect of frequently recurring types of reaction and denotes a permanent renunciation to effective adjustments.

The psychogenic theory has brought epilepsy into line with other functional nervous disorders attributable to adaptational failure. The tendency is to regard hysterical and epileptic reactions as symptoms of temporary disintegration of functional levels of the nervous system. The hysterical attack is obviously psychogenic in origin, and may exhibit all grades of severity, from a simple hysterical 'fit' up to the complex seizure of major hysteria (hystero-epilepsy). In the attack the disturbance of consciousness is superficial and slight. In the epileptic fit, the convulsion passes rapidly over into deeper levels, the muscular reactions are disorganized, and consciousness is early and completely abolished. There would appear to be a 'border zone', however, in which it is difficult to say whether the observed attack is of a hystero-epileptic nature or is genuinely epileptic.

It has been stated that emotional shock may lead to attacks in no respect different from those of idiopathic epilepsy; and it is contended that the psychogenic origin of a seizure should not be ignored because in the fit the patient has bitten his tongue or has been incontinent. "We are compelled to recognize that certain patients exhibit seizures clinically indistinguishable from ordinary epilepsy as reactions to situations of a purely psychical nature. In other words, the attacks are due to extraneous psychical causes such as have been supposed to be characteristic of hysterical fits only."<sup>3</sup>

But the experience of the recent war has thrown a somewhat remarkable light upon this subject. Although the psychoneuroses have shown a largely increased frequency under conditions of mal-adjustment and mental conflict in war experience, genuine epilepsy arising *de novo* under war conditions has been rare. The majority of epileptic soldiers were epileptic before joining the army, and many so-called epileptic fits in soldiers were in reality hysterical convulsive reactions. It may be agreed that individual seizures may arise from emotional stress or mental conflict in a patient with established epilepsy; but a much fuller understanding of the mechanism of epilepsy and of its root causes is necessary before the purely psychogenic causation of this disease can be accepted, and its treatment by psychotherapy regarded with assurance. In order to establish epilepsy as such, we have to look beyond the seizure or its equivalent

reaction, and to find it in the characteristic temperament or mental make-up, and in the tendency towards mental enfeeblement which invariably follows in the chronic or confirmed disease.

The acceptance of the psychogenic origin of epilepsy obviously affects its treatment as at present conducted. But as the fit itself may form a stumbling-block to satisfactory adaptation, and prove an incubus to a return to health and work, any medicinal remedy which will subdue, minimize, or arrest the seizures may be prescribed. On the other hand, we know that the prevention or postponement of a fit is not always desirable. The fit, in some instances, is so definitely a reaction to a difficult situation, which the patient is unable to meet normally, that its occurrence 'clears the air' and a feeling of relief is the outcome.

The theory of the psychogenic causation of epilepsy therefore has opened up another route along which the study of this intractable disease may again be approached.

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- <sup>1</sup> PROF. DR. E. REDLICH, *Die klinische Stellung der sogenannten genuine Epilepsie*, Berlin, 1913.
- <sup>2</sup> PIERCE CLARK, "Clinical Studies in Epilepsy", *Psychiatric Bull.*, New York, 1916, January and April; 1917, January and October.
- <sup>3</sup> Annotation, *Lancet*, 1919, ii, 791.



## Editorial.

### CONDITIONALISM AND CAUSALISM.

MUCH of the antagonism that is often found to exist between the psychological standpoint and the organic standpoint in medicine arises from a lack of a mediatory symbol that makes both attitudes possible and valid. The tendency either to take an extremely psychological or an extremely material view of certain forms of sickness is partly due to the old conception of *causalism* in the etiology of disease. Medicine has been cursed by a narrow outlook, which seeks to find one specific and definite thing as a cause for a most complicated condition such as insanity or neurotic sickness. A garden that has turned into a profusion of weeds has done so because of many factors in conjunction. In other words, the old conception of *causalism* needs to be replaced by the more modern and broader one of *conditionalism*. In a recent paper Jung pleads for this replacement. "Tuberculosis", he remarks, "is no longer held to be caused by the specific bacillus. It owes its existence to a number of competitive causes. . . . Undoubtedly a psychological cause can hardly ever produce insanity unless it is supported by some specific predisposition, but on the other hand a marked predisposition may exist where a psychosis may not arise so long as serious conflicts or emotional shocks are avoided." With the development of a standpoint of conditionalism in medicine more room is at once given to newer theories and a greater flexibility gained, so that co-operation is possible. To deny the psychological factor is as foolish as to deny the physiogenic factor in illness, but we tend to concentrate attention exclusively upon either one or the other. The integration of the nervous system, the integration of the endocrine system, or the integration of the conscious and unconscious realms of the human psyche, are not independent phenomena. Man is the supreme integration of every system, nervous, vascular, glandular, or psychological. The theories of compensation or co-ordination are not conceived of broadly enough as implicating all the systems, from the most psychological and subjective, down to the most physical and objective. For example, we do not think of studying the degenerative changes found in the endocrine system and the central nervous system in dementia præcox

in conjunction with the psychological picture, because we are accustomed to think that the psychological changes and the physiological degeneration go hand in hand and are merely different aspects of the same thing. The view that changes in the physiological may be compensatory to the psychological stress and disharmony—that is, that they may be attempts at healing or compensation at the physiological level, and *vice versa*—is foreign to medical thought. It is only recently that the endocrine system has been seriously considered in this country. To those who are disinclined to believe in the possibility of a psychological factor behind many forms of sickness, the endocrine system comes as a vast relief. Every peculiarity of temperament and behaviour is attributed to some peculiarity in the endocrine pattern alone. In America, however, the recognition that the endocrine system is the link between the psychological and physical is general, and the idea that the psychological attitude can influence the endocrine system, which in turn can influence the body, as well as that the endocrine system can influence the psychological attitude, is not regarded as being beyond the realms of possibility. Such ideas give us a wide outlook, and lead to a conception of illness that is based more upon conditionalism than upon causalism. At the recent debate at the meeting of the British Medical Association at Cambridge upon psychogenesis in mental disease, many speakers gave it as their opinion that both a psychogenic and a physiogenic factor were to be considered.

We would plead, therefore, for the introduction of the conception of conditionalism into modern medical thought in this country, so that the various factors behind sickness may receive thorough consideration and not lead to antagonistic points of view. We are confident that once the full recognition of the importance of the psychological factor in some forms of illness is admitted, a reconciliation of the psychological and organic points of view in medicine would become possible through the conception of conditionalism. At present those who recognize the psychological factor are almost forced to be extremists, because of the necessity for defending their standpoint against those who ridicule the idea that certain mental and emotional attitudes towards life can ever interfere with perfect health.

## Abstracts.

### Neurology.

#### NEUROPATHOLOGY.

- [18] Bulbar neuroglia in general paralysis, and the significance of its occurrence in the bulbar olives (La névroglic bulbaire dans la paralysie progressive—sa signification dans les olives inférieures).—ROSSI. *Arch. ital. de Biol.*, 1919, lxi, 55.

THE cortex in general paralysis of the insane has been the object of much more research than subjacent areas of the central nervous system, but in that disease there are numerous clinical symptoms—ataxia, dysarthria, tremor, etc.—for which no cortical pathogenesis is probable. Rossi has found, in the medulla of a number of typical cases of the disease, primary neuroglial overgrowth, of varying degree, round the upper end of the central canal, under the floor of the fourth ventricle, and round the nuclei of origin of the lower cranial nerves: in particular, throughout the inferior and accessory olives a marked amount of gliosis with hypertrophy of astrocytes is to be noted. Rossi emphasizes the clinical significance both of the sub-ependymal and the olivary gliosis, sometimes amounting to actual nodular glioma-formation, from the point of view of the symptomatology of the disease: the presence of this process entails a functional disturbance and eventually a degenerative atrophy of bulbar mechanisms: in fact, there is a bulbar ataxia as a consequence of impairment of olivo-cerebellar fibres, the significance of which can be better understood as a result of Rossi's investigations in a field hitherto largely neglected.

WILSON.

- [19] Histopathology of dementia præcox.—EVA RAWLINGS. *Amer. Jour. Insan.*, 1920, lxxvi, 265.

TWELVE cases of dementia præcox were studied by the author. No case without a clear præcox history was dealt with, and the autopsies were usually held within an hour after death. Owing to the irregularity of the changes found in the nervous system in cases of dementia præcox it is worth while recording the findings of this researcher. She concludes that in the twelve cases regular and uniform pathological changes had occurred, which were due neither to arteriosclerosis, to senility, nor to a long-continued grave toxic process. The pathological process is essentially a chronic one, resulting in atrophy of the nerve-cell body and its nucleus and disappearance of the stainable substance, and an atrophy with distortion of the protoplasmic prolongations, the process terminating in extreme

pyknotic atrophy or in fragmentation of the nerve-cell. Considered from the regional point of view, the organic changes observed were generally found to be most severe in the frontal regions, while of the two hemispheres the changes in the right one were usually much more recent and acute than those in the left. As regards nerve-cell strata, the first, second, and third nerve-cell layers showed the most severe involvement, the severity and diffuseness of the changes decreasing towards the third stratum. The author gains a general impression from her work that the initial pathological process is one of moderate swelling of both cell-body and nucleus, followed by a gradual breaking down of the normal nuclear chromatic structure, and later by atrophy and fragmentation of the neurofibrils. She believes that the changes she describes are pathognomonic of dementia præcox.

MAURICE NICOLL.

[50] Atypical form of arteriosclerotic psychosis.—S. UYEMATSU. *Jour. Nerv. and Ment. Dis.*, 1919, I, 513.

THE case described is that of a married woman who, at the age of 40, began to have headaches, which became more severe as the disease progressed. She gradually lost her memory, and progressively became demented, disoriented, and showed stereotyped conversation and echolalia.

Physical examination revealed irregular and unequal pupils, which reacted slowly to light and failed to react to accommodation. Her reflexes were exaggerated, with ankle-clonus on the right side, but no Babinski sign was present. There was tremor of the hands, tongue, and lips. So far the case resembled progressive general paralysis, but the Wassermann reaction in the blood and cerebrospinal fluid was negative. The spinal fluid, however, showed 96 cells (? per c.mm.). The patient died eight years after the onset of symptoms.

At the autopsy all the arteries supplying the brain were very sclerotic. The brain was shrunken, with widened sulci, and an excess of subarachnoid fluid. The atrophy of the gyri was almost symmetrical on the two sides, corresponding to the regions of supply of the middle and posterior cerebral arteries, but some areas supplied by the middle cerebral, such as the island of Reil, and the opercular portion of the left hemisphere, were intact. Over the areas of greatest atrophy the cortex showed a moth-eaten appearance, and on section no distinction could be made out between grey and white matter.

Microscopic examination showed two main types or stages of change in the atrophic parts of the brain: (1) At the point of greatest shrinkage of the cortex were seen wedge-shaped scarred areas, formed of spider-cells and granular corpuscles, along with overgrowth of the small vessels, and complete disappearance of the nerve-cells and their processes. (2) Side by side with these were cystic areas, where the section had a sponge-like appearance. These were made up of glial cells and fibres, the meshes of which were distended with fluid. In these areas also there were many granular corpuscles, and the blood-vessels were increased in number and showed 'packet formation'. Areas showing such changes were present on

the cortex of the cerebellum as well as of the cerebrum, and in both cases they extended right up to the pial surface. In places a communication could be made out between the cystic spaces and the subarachnoid space. The ganglion-cells in the neighbourhood of the atrophied areas were in various stages of degeneration.

The author compares this condition to the 'spongiöser Rindenschwund' of Fischer and the 'état vermoulu' of Pierre Marie, to both of which it is closely allied.

J. G. GREENFIELD.

[51] Lesions of the corpus striatum in tuberosc sclerosis, and their relation to the findings in other diseases of that part of the brain (Ueber Veränderungen des Striatums bei tuberöser Sklerose und deren Beziehungen zu den Befunden bei anderen Erkrankungen dieses Hirnteils).—BIELSCHOWSKY and FREUND. *Jour. f. Psychol. u. Neurol.*, 1918, xxiv, 20.

THE patient was a man, age 36, obviously retarded in development from early years, who was regarded, briefly, as an epileptic idiot. He showed various of the cutaneous formations associated with tuberosc sclerosis. Voluntary movements were slow and awkward, a variable degree of hyper-tonus was present in the limbs, and a form of pseudodollexibilitas cerea. Sometimes, further, the hands assumed the attitude of paralysis agitans, with the terminal phalanges, if anything, over-extended.

At autopsy, the diagnosis of tuberosc sclerosis was fully established. In addition to the characteristic changes, which need not be particularized, pathological glia-overgrowth was found in the cortex in gyri which appeared normal macroscopically; and in the caudate nucleus minute 'tumours' were present, of the usual tuberosc structure. In the corpus striatum, further, numbers of giant ganglion-cells were observed, and of 'monster' glia-cells, as well as undifferentiated cells (spongioblasts). Whereas in the cortical lesions these elements were more or less collected together, in the corpus striatum they were scattered diffusely. In putamen and nucleus caudatus, finally, calcareous nodular deposits were met with. A second case of tuberosc sclerosis showed a lesser degree of identical alterations in the corpus striatum.

The authors consider there are analogies between this condition of the corpus striatum in tuberosc sclerosis and what has been described by Alzheimer and others in so-called pseudosclerosis, viz., increase of glia in cortex, basal ganglia, pons, cerebellum, and elsewhere, the occurrence of giant glia-cells and of glia-cells with multiple nuclei. Westphal also is inclined to link pseudosclerosis to tuberosc sclerosis. The authors think it probable that the former is a diffuse form of the latter, that the glial overgrowth is in no way dependent on degeneration of nerve parenchyma, and that it may be a kind of blastoma-formation. They are sceptical, however, of the suggestion that progressive lenticular degeneration is identical with pseudosclerosis, and cite a case of the former minutely examined by them in which the glial peculiarities of the latter were completely absent, notwithstanding careful search. They consider that progressive lenticular



degeneration is a mainly local parenchymatous degeneration with secondary glial changes, whereas pseudosclerosis consists of a primary glial alteration of a quite diffuse character.

WILSON.

[52] **Tuberose sclerosis** (À propos de la sclérose tubéreuse).—L. BABON-NEIX. *Revue Neurol.*, 1918, xxv (2), 17.

THE histology of tuberose sclerosis is well known, and its association with other lesions, such as hypernephroma, persistence of the foramen Botallii, and sebaceous cysts of the skin, has been frequently noted. The author's conception of the disease is: (1) That there is no evidence of inflammation in the brain: (2) That the fundamental lesions in the tuberocities are (a) a partial fusion of the grey and white matter, (b) the presence of giant-cells of neuroglial origin, (c) a mingling of the various layers of the grey matter, a diminution in the number of the large pyramidal cells, which are poorly differentiated and abnormally oriented, and a poor formation of tangential fibres; (3) That the tuberocities in the cortex and corpus striatum do not constitute the whole disease, but are constantly associated with malformation or neoplasm of various organs of the body, of which the following list is given:—

*Malformations.*—Macroscopic changes in the nervous system, such as agenesis of one hemisphere, a lobe, a convolution, the corpus callosum, the olives, one corpus mamillare or one cerebral peduncle: fusion of the olive with the pyramid, congenital hydrocephalus, spina bifida, or non-pigmentation of the iris.

The skull may show various malformations, and abnormalities may be found in face, ears, and palate, and also in the digestive organs. In the circulatory system there may be congenital malformations of the heart and aorta. The testicles may be small and undescended, and there may be incomplete development of the penis, or total or partial lack of hair.

*Tumours.*—In the heart there may be pure rhabdomyomata or mixed simple tumours containing striped muscle fibres, columnar epithelium, or cartilage. In the kidneys the commonest tumour is a typical hypernephroma; but mixed simple tumours may also occur. In the skin a variety of tumours may be present—pigmented or hairy moles and naevi, sebaceous cysts and adenomata, and diffuse papillomata, in addition to molluscum fibrosum or neurofibromata similar to those of Recklinghausen's disease.

The author accounts for these abnormalities on the theory of developmental error affecting the three primitive embryonic layers, especially the ectoderm. This appears to come on late in foetal life. He considers that there is a strong probability that syphilis plays some part in the etiology of the disease. The evidence for this rests both on the similarity of some of the lesions to those found in congenital syphilis, and on a history of premature birth, repeated abortions, or other symptoms of syphilis in the parents. He does not, however, consider the evidence so far conclusive.

J. G. GREENFIELD.

- [53] The cerebrospinal fluid in herpes zoster and the relation of herpes zoster to syphilis.—W. H. BROWN and B. DUJARDIN. *Brain*, 1919, xlii, 86.

THE paper summarizes the results found in a total of forty-two cases of herpes zoster in which the cerebrospinal fluid was examined in its uncentrifuged state. Attention was directed to cell count, albumin content, globulin content, and Wassermann reaction. The results were as follows: Lymphocytosis in 28 cases, most marked in cases with slight eruption. No polymorphs seen throughout the series. Albumin: a slight excess in the majority of cases, most in those with large cell counts. Globulin: one case only clear excess, and this one had a marked lymphocytosis. Wassermann test negative, except in clinically syphilitic cases.

In a large lock department, occurrence of herpes zoster was 4 per 1000, as against 1 per 1000 ordinary non-syphilitic cases, the latter compiled from general hospital wards.

J. LE FLEMING BURROW.

- [54] Histopathologic study on two cases of 'central neuritis'; demonstration of a new granule ('nucleoproteid-like granule') in the neuroglia cells.—K. MARUI. *Arch. of Neurol. and Psychiat.*, 1919, ii, 1.

IN 1901, Adolph Meyer described, under the designation 'central neuritis', a widely distributed and strikingly symmetrical parenchymatous degeneration of numerous nerve elements, occurring in peculiar forms of depressive disorders, senile and other psychoses. The cortical nerve-cells show axonal reaction, with decay of the medullary sheaths of some of the corresponding sets of fibres, but there is no gliosis or vascular infiltration.

Almost all the Betz cells in Marni's two cases of central neuritis were in a more or less advanced stage of axonal reaction. The intracellular neurofibrils were found to be fragmented, their alteration keeping pace with the dissolution of the Nissl bodies. Marchi preparations showed definite but scanty myelin-sheath degeneration in the paracentral lobules and anterior central convolutions. The axis-cylinders in Alzheimer and Mann preparations, where normal, stained a deep-blue colour; others, apparently morbid, showed an interesting alteration in their affinity for stains. Of these, some showed red-stained parts, while others remained unstained for certain lengths. The appearance of some axis-cylinders was that of strings of changing colour: the red-stained parts were regarded as representing a more advanced stage of alteration than those which were uncoloured. Amoeboid glia-cells carrying different kinds of granules were also observed; some were identified as Alzheimer's methyl-blue granules; others as fuchsinophil granules. In the protoplasm of amoeboid glia-cells peculiar 'nucleoproteid-like granules' were discovered. They do not appear to have been previously noted. They were rather small, rounded, and of almost uniform size, and were never observed lying free in the tissues or in the perivascular spaces. In thionin-blue preparations of both formalin- and alcohol-fixed material they stained blue or an exquisite

metachromatic colour; illumination by electric light rendered them especially visible. In their microchemical reactions they behaved like the Nissl-bodies of nerve-cells, and could not be mistaken for Reich  $\pi$ -granules. Nervous tissue taken from 70 insane and general hospital cases was examined for the presence of these granules; they were found in 45 cases, and thus cannot be regarded as peculiar to this condition.

The author concludes that the presence of 'nucleoproteid-like granules' in amoeboid glia-cells indicates that neuroglia has a constructive function as well as a scavenger function, and that this granule is given to the neuroglia cells in an afferent direction.

R. M. S.

- [55] **A microscopic study of fat in the cerebral cortex.**—OSCAR J. RAEDER. *Arch. of Neurol. and Psychiat.*, 1919, i, 525.

THE material used in this investigation was obtained from apparently normal brains of young adult male subjects. In one case death was caused by trauma; in the remaining two cases death was due to measles and bronchopneumonia, with which there was associated high fever. Fatty pigment, in the form of minute discrete droplets, was present in some degree in the nerve-cells of all cortical layers. It occurred most abundantly in the fourth and sixth layers (Campbell's nomenclature), the next most frequent locality being the seventh zone. Fat was found in negligible amounts in the first, second, and fifth layers. It was also found in variously-shaped and irregular masses—never in droplets—in the walls of the cortical vessels, and to a lesser extent in those of the white matter. In the two cases with terminal infection there was a remarkable increase of fat in the third and seventh layers.

R. M. S.

- [56] **Pathogenesis of homolateral hemiplegia** (*Recherches sur la pathogénie de l'hémiplégie homolatérale*).—V. DEMOLE. *Revue Neurol.*, 1918, xxv, 100.

A CASE is recorded of cerebral glioma in the left frontal lobe in which the paralysis of the limbs was greater on the left side, with a Babinski sign in the left foot only. It was noted at the autopsy that the right frontal lobe was compressed by the tumour, which considerably passed the middle line, and also that the falx cerebri was rudimentary, being represented only by a ridge 5 mm. in depth.

The author considers that in this case, and in the majority of the recorded cases, the presence of homolateral hemiplegia may be explained by pressure of the tumour on the opposite hemisphere. This is particularly likely to occur when the falx cerebri is narrow, lax, or defective. He rejects the other theories, such as non-decussation of the pyramids or compression of the opposite pyramid against the edge of the foramen magnum, oedema affecting the opposite hemisphere, and diasthesis. In the case described, epileptiform fits were present, with deviation of the head and eyes to the right, which pointed to a lesion of the pyramidal tracts in their cerebral rather than in their medullary course.

Further, as any tumour in the anterior or upper part of one cerebral hemisphere will cause the other hemisphere to be pushed upwards towards the vertex, the corpus striatum of that side may come to lie in closer relation to the tumour than that of the homolateral side, which will be pushed backwards or downwards. It is therefore possible for a tumour to compress the internal capsule of the opposite hemisphere more than that of the hemisphere in which it arises.

J. G. GREENFIELD.

- [57] The relation of papillœdema ('optic neuritis') to ventricular dilatation in the course of cerebral tumours (Stase papillaire et dilatation des ventricules au cours des tumeurs cérébrales).—BOLLACK, *Ann. d'Oculist.*, 1919, clvi, 538.

It has long been recognized that tumours in certain cerebral areas are more likely to give rise to papillœdema than others, and Bollack has come to the conclusion that the condition of dilatation of the ventricular system is the intermediate factor between the position of the tumour and the ocular disturbance. His research is based on 27 cases of cerebral tumour, 23 with papillœdema; 14 out of 15 cases of subtentorial tumour were accompanied by it. Dilatation of the third ventricle invariably is associated with papillœdema, and the reverse is usually true, whereas dilatation of one or other lateral ventricle is much less likely to be so accompanied. In almost every case of papillœdema (16 out of 20) the aqueduct of Sylvius was distorted in one form or another, while it was normal in cases without papillœdema. Ventricular dilatation is the sequel to ventricular hypertension, and this occurring in the course of cerebral tumours may be caused by disorders in the production, resorption, or circulation of the cerebrospinal fluid. Ventricular hypertension affects the third ventricle before any other part of the system.

Bollack proceeds to examine the relation of ventricular distention and papillœdema, and criticizes several well-known theories. His own view, supported by minute and ingenious histologico-anatomical investigations, is that the pressure acts directly on the optic chiasma at a spot which he calls the ependymo-prechiasmatic triangle; this is the area where the layer of grey matter forming the antero-inferior limit of the third ventricle abuts on the antero-superior aspect of the chiasma, at an acute angle. Here Bollack has found constant pathological alterations, absent in cases of cerebral tumour without ventricular dilatation and papillœdema.

WILSON.

- [58] A study of the brains and spinal cords in a family of ataxic pigeons.—HOSKINS, *Jour. of Comp. Neurol.*, 1919, xxxi, 111.

The affected pigeons (four in number), whose descent from the originally affected female bird is traced with exactitude through four generations, presented typical static disequilibrium, ataxia of gait, "like a drunken man", and ataxia of wing muscles, rendering flying impossible. Nystagmus was not present, and rotatory tests had the same result as in normal birds.

Pathologically, the cerebellum, medulla, and cord were obviously small

in proportion to the rest of the brain, in all the birds, and reduced in weight considerably below the average. Microscopically, the lesions consisted of decided reduction in thickness of the molecular layer of the cerebellar cortex, marked reduction of the cerebellar peduncles, formatio reticularis of the medulla, and medullary olives: in the cord, defective development of the dorsal columns, spinocerebellar tracts, and Clarke's columns.

This congenital hypoplasia, with no evidence of definite degeneration and neuroglial overgrowth, is of interest in view of its close analogy, both in the segments of the neuraxis affected and the special incidence of the atrophy in these segments, to the hypoplasia frequently met with in Friedreich's disease and the spinal-cerebellar form of degenerative ataxia (Marie's 'hereditary cerebellar ataxia').

WILSON.

- [59] Regeneration of the posterior roots in cases of complete division of the dorsal cord (Sur la régénération des racines postérieures dans la section complète de la moelle dorsale).—J. LHERMITTE. *Revue Neurol.*, 1919, xxvi, 129.

It has long been disputed whether or not the fibres of the spinal cord are able to regenerate. Lhermitte took advantage of the wonderful opportunities for histological investigation afforded by traumatic injuries of the cord in the recent war, and has done much to settle the question.

Using Bielschowsky's method, the author has obtained evidence of regeneration in four cases of complete transection of the spinal cord. In two of the examples the injury was due to crushing of one or more segments in the dorsal region: in the third the cord was divided by a bullet, the meningeal sheath being preserved: and in the fourth the ends of the cord had been sutured together at operation.

If regeneration of fibres has been going on, the stumps of upper and lower portions of the divided cord are different from one another in appearance even to naked-eye examination. The stump of the upper portion looks clean-cut, while that of the lower portion is irregular and ragged, and budlike processes protrude from its surface. When examined histologically the regenerated fibres are almost invariably grouped in distinct bundles, which may be situated in the pia mater, the sheath of a vessel, or degenerated tissue. In contradistinction to the fibres which compose spinal tracts, new axis-cylinders rarely run parallel to one another: they twist about and form a regular entanglement. Newly-formed fibres can be recognized by the regularity of their outline, their small calibre, their waviness, and segregation into long spiral bundles. These fibres originate from the posterior roots. Sections at the level of entry through the pia mater show that the bundles of sensory fibres penetrate the deep layer of the leptomeninges, disperse in this region, and become continuous without interruption with the scattered bundles of regenerated fibres. In the sclerosed tissue, which in places surrounds the posterior roots at their point of entry in the pia mater, some fibres which have met the obstacle formed by the pia mater can be seen to have turned back and travelled round the posterior surface of the meninges.



The fibres of the posterior roots are endowed with great regenerative power. Even in the middle of dense scar-tissue a few axis-cylinders showing the phenomena of regeneration can usually be seen. This inherent power of growth of posterior root fibres is in marked contrast to the regenerative inertia of fibres in the long spinal tracts. In no case was there the least evidence of proliferation of the pyramidal bundles in the upper segment of the cord, or of the cerebral or posterior bundles in the lower segment.

Lhermitte believes that regeneration of motor fibres in the spinal cord never occurs in man, and in consequence suture of the transected cord, however exact, is useless. As to recovery of sensation he is uncertain, but he states that in two patients, who were under observation for fifteen and eighteen months respectively, there appeared to be some return of sensibility in the lower limbs.

G. RINDOCH.

[60] The significance of phylogenetic and ontogenetic studies for the neuropathologist.—B. BROUWER. *Jour. Nerv. and Ment. Dis.*, 1920, li, 113.

THE author's argument in this interesting paper is that the more recent acquisitions of the central nervous system are less resistant to noxious agents than older parts; and he illustrates his contention by a consideration of disseminated sclerosis, a disease in which, despite the irregularity of the foci, for some reason a certain group of symptoms appears to predominate.

The abdominal reflexes occur in primates only, and in man they do not appear till some months after birth; they are phylogenetically and ontogenetically recent, and therefore lost early. When we consider that synchronous lateral movement of both eyes in a horizontal direction is a function which is only present in higher mammals, where the position of the eyes and the shape of the face make it possible, we can understand why horizontal nystagmus is an early and regular symptom. Similar considerations explain the pallor of the temporal half of the optic disc. Two changes have occurred in phylogenesis—a large group of uncrossed fibres has appeared, and the macular bundle has increased. These new fibres arise from the temporal half of the retina, and remain in the lateral part of the optic nerve; atrophy therefore occurs in the phylogenetically younger part of the disc. The mental changes, speech defects, and sensory and motor disturbances of disseminated sclerosis are considered from the same standpoint.

In the second part of the paper fifteen cases of median neuritis, with isolated wasting of the abductor brevis and opponens pollicis are described and discussed. The author rejects so-called occupation-neuritis and over-functioning as adequate explanation of the selective action of the morbid process: he holds that these muscles, and these alone, were picked out first and most, because they are phylogenetically younger than other muscles, which, though submitted to the same strain, remained normal.

W. J. ADIE.

- [61] A classification sketch of the heredodegenerations of the central nervous system (Entwurf eines Systems der Heredodegenerationen des Zentralnervensystems einschliesslich der zuhörigen Striatum-krankungen).—MAX BIELSCHOWSKY. *Jour. f. Psychol. u. Neurol.*, 1918, xxiv, 48.

BIELSCHOWSKY's proposed classification of the inherited neural degenerations is as follows, incomplete though its author allows it to be in the present state of knowledge:—

I. PURE DYSPLASIAS.

- A. Cortical malformations: micropolygyria, pachygyria, agyria.
- B. Malformation of corpus striatum: état marbré.
- C. Malformation of more caudal parts of neuraxis: micro-myelia, syringomyelia and its analogues.

II. DYSPLASIAS WITH A BLASTOMA ELEMENT. Tuberosc sclerosis (related to glioma and Recklinghausen's disease).

III. ABIOTROPHIES.

- A. Abiotrophies with a blastoma element: pseudosclerosis (and certain forms of diffuse sclerosis?).
- B. Abiotrophies with local total necrosis of the parenchyma:—
  - 1. Necrosis of putamen and globus pallidus: Wilson's disease and progressive torsion-spasm.
  - 2. Necrosis of globus pallidus: a solitary case recorded by Fischer.
- C. Abiotrophies with selective necrobiosis of ganglion cells:
  - 1. *a.* Universal cell-degeneration: amaurotic family idioey.
  - b.* Ditto with special involvement of certain systems: juvenile (chronic) amaurotic idioey with cerebellar atrophy.
  - 2. Selective degeneration of certain cell-systems:
    - a.* Of nucleus caudatus and lentiformis: chronic chorea.
    - b.* Of cerebellar systems: cerebellar heredo-ataxia in its many forms.
    - c.* Of corticospinal system: spastic spinal paralysis, spinal amyotrophy, amyotrophic lateral sclerosis.

WILSON.

### SENSORIMOTOR NEUROLOGY.

- [62] Parenchymatous atrophy of the cerebellum.—LA SALLE ARCHAMBAULT. *Jour. Nerv. and Ment. Dis.*, 1918, xlviii, 273.

The case was that of a man of 57, who suffered at the age of 17 from a severe illness, apparently of a toxic or infective nature, as a result of which he showed slight but definite signs of defective cerebellar function. Very gradually these signs became intensified, and when he came under observation his condition was one of advanced cerebellar disturbance. In addition, there was a definite rigidity of certain muscular groups, and the

more or less permanent involuntary adoption of flexor, pronator, and adductor attitudes. Atypical nystagmus was noted. The plantar reflexes were flexor in type.

The cerebellum was much reduced in size, not quite symmetrically, while the cerebrum showed no recognizable departure from normal. The lesions in the former were strictly confined to the cerebellar cortex, which was so severely and generally degenerated as to be practically suppressed. The Purkinje cells were grossly affected and had almost entirely disappeared; molecular and granular layers were equally defective. By comparison, quite insignificant secondary atrophies were found in the central nuclei and in the olivary bodies and olivo-cerebellar systems. The superior cerebellar peduncles and red nuclei were for all practical purposes normal. Archambault attributes the cortical parenchymatous degeneration in part at least to disease of the pial vessels entering the cortex, which were thickened and reduced in lumen, but he states that others might not so explain the changes. Seemingly only a quite moderate degree of glial reaction was noted.

Archambault gives a useful discussion of the correlation between the clinical and the pathological findings. It is curious, however, that no explanation is attempted of the tremors forming a prominent symptom in the case, especially in view of the apparent integrity of the cerebello- tegmental systems. Further, the patient's attitude and certain other features were reminiscent of paralysis agitans, and it is regrettable that so exhaustive an examination does not appear to have included a microscopical investigation of the basal ganglia and regio subthalamica. A full précis is given of previously recorded cases, with the exception, curiously, of that published by Holmes (*Brain*, 1907, xxx, 466), which is as a fact one of the most striking of them all.

WILSON.

- [63] Continuous clonic rhythmical contractions of the soft palate and pharyngeal wall in a case of gunshot wound of the cerebellum (Beitrag zur anatomischen Grundlage und zu Physiopathologie der kontinuierlichen rhythmischen Krämpfe nach Herderkrankungen des Kleinhirns nebst Bemerkungen über einige Fragen der Kleinhirnfaserung).—PFEIFER. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 96.

A SOLDIER was wounded by a shrapnel bullet entering the head some four centimetres behind the left mastoid. At a subsequent date he presented highly characteristic left cerebellar symptoms, and, in addition, there were continuous clonic tremor or involuntary contractions of the soft palate, left side of the pharynx, and, to a less extent, of the left vocal cord. In the absence of a pathological examination, Pfeifer is content to record the documentary value of his case, and to assign the clonic contractions to that group of involuntary movements known to develop on experimental separation of the cerebellum from its pontomedullary connections. As there was no volitional paralysis of the muscles in movement, the phenomenon is a purely cerebellar one, comparable to nystagmus (Pfeifer does not mention the term 'palatal nystagmus' sometimes employed) and to tremor of mid-brain type.

WILSON.

- [64] The physiopathology of continuous rhythmic contractions after lesions of the cerebellum (Kontinuierliche, klonische, rhythmische Krämpfe des Gaumensegels und der Rachenwand bei einem Fall von Schussverletzung des Kleinhirns).—KLIEN. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 1.

KLIEN gives a minute anatomical investigation of a case of continuous rhythmic contractions of all the muscles involved in swallowing, from palate to diaphragm, coupled with synchronous clonic twitches of the orbicularis oculi, following an apoplexy, and continuing unchanged for eleven months, until death. Post mortem there was found an old lesion in the right cerebellar hemisphere in the immediate vicinity of the dentate nucleus, spreading outwards to destroy the white substance of the lobus semilunaris superior; a considerable portion of the dentate in its ventral aspect was involved in the lesion. From it degenerations were readily traceable to the cerebellar cortex of the same and of the contralateral side, to the red nucleus, and to *both* olives.

Among the various anatomical conclusions, for the details of which the original must be consulted, reference may be made to the evidence adduced by Klien in favour of the view that the olivocerebellar connections are to a considerable extent from cerebellum to olive, i.e., cerebellofugal, and not only cerebellopetal as has been so often maintained.

On the physiological side the author's view, admittedly hypothetical to a large extent, may be expressed as follows. The cerebellum exercises a tonic influence over the functioning of Deiters' nucleus: when the former is diseased, impulses going from the latter to the eye-muscle nuclei are so altered that nystagmus results; analogously, the motor nuclei of pons and medulla are under the influence of stimuli from the nucleus motorius tegmenti (Edinger), of which Deiters' nucleus is but a part; if the latter functions imperfectly owing to cerebellar defect, 'nystagmus' in the former motor mechanisms will result; among these is the mechanism for swallowing.

WILSON.

- [65] Clinico-anatomical contributions to our knowledge of aphasia, agnosia, and apraxia (Klinische und anatomische Beiträge zur Kenntnis der aphasischen, agnostischen, und apraktischen Symptome).—VON STAUFFENBERG. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1918, xxxix, 71.

OF the eight cases reported with a wealth of detail in this very long paper, reference may be specially made to two in which apraxia was a prominent symptom.

The first was that of a man, age 56, whose symptoms consisted, *inter alia*, of pronounced left-sided motor apraxia and tactile agnosia, and of bilateral ideational apraxia. In addition, the phenomenon of tonic innervation as described by Wilson and Walshe was present in the left arm and hand. Pathologically important lesions were the following: destruction of the corpus callosum in its middle and posterior thirds, and spread of the lesion in the right hemisphere to the under-surface of the parietal and

supramarginal cortex; by these the left-sided apraxia, tactile agnosia, and tonic innervation can be understood. The more general psychical symptoms shown by the patient, inclusive of the ideational type of apraxia, are assigned by the author to the diffuse vascular condition and to the reduction as a whole of the white matter of the left hemisphere.

The other case was that of a man of 45, with right homonymous hemianopia, right hemiplegia (flaccid), right hemianæsthesia; his psychomotor and psychosensory symptoms consisted in slight sensory aphasia, perseveration, echolalia, and, on the left side, a severe degree of apraxia more or less of a mixed type. The pathological basis for the symptoms was a large area of softening round the left supramarginal gyrus, spreading deeply into the brain; no vascular changes otherwise were noticeable. The author discusses the possible explanation of the apraxia, and attributes it, in part at least, to 'Fernwirkung', i.e., to the distant effect of the lesion on linked neuronic systems, mainly those of the frontal and corpus callosum areas. It is probable, further, that a degree of functional separation of the left sensorium from the motorium occurred, a condition emphasized by Liepmann and others as being of significance for apraxia.

WILSON.

[66] A case of encephalitis periaxialis diffusa of Schilder [Ein Fall von Encephalitis periaxialis diffusa (Schilder)].—VON STAUFFENBERG, *Zeits. f. d. g. Neurol. u. Psychiat.*, 1918, xxxix, 56.

ENCEPHALITIS periaxialis diffusa is a rare disease, of which apparently only some seven instances have been recorded. It presents certain peculiarities distinguishing it *in toto* from any other nervous disease, with the exception, in some respects, of disseminated sclerosis.

V. Stauffenberg's patient was a woman medical student, age 21, whose illness led to a fatal issue in eight months. It began with ocular symptoms in the form of amblyopia, restriction of the field, and left papillitis, followed by temporal pallor. These ocular phenomena rather cleared up after three months, to be followed by a somewhat silly euphoria. A diagnosis of disseminated sclerosis was made. Later the right eye became almost blind, reflexes were exaggerated, visual agnosia appeared, first the left and then the right limbs became anæsthetic and spastic, and there was a double Babinski sign. Eventually a coma supervened on top of a progressive psychical deterioration. The cerebrospinal fluid was under pressure, and showed a great pleocytosis. During the illness moderate rise of temperature occurred again and again. A subsequent diagnosis of some form of encephalitis analogous to acute disseminated sclerosis was suggested.

Pathological examination revealed in characteristic form the peculiar changes of encephalitis periaxialis diffusa. Great areas of the subcortical white matter were absolutely colourless with Pal's method, indicating complete stripping of the myelin sheaths of the fibres of projection and association. With slight exception the cortex itself stained normally, rendering the contrast between it and the white matter the more striking. The zone of arcuate fibres indicating junction of grey and white matter stood out prominently. A similar lesion was found in the optic



chiasma. The diseased areas resembled plaques of disseminated sclerosis in the conservation of the axons as seen by Bielschowsky's method. The sheaths of the vessels in these areas were filled with cells; glial cells were abundant throughout, especially of the spider type.

It is mainly the remarkable limitation of the morbid process to large subcortical areas, somewhat greyish-yellow or greyish-green on fresh section, sharply differentiated from the cortex, that distinguishes the disease from disseminated sclerosis, to which, nevertheless, it is probably akin. V. Stauffenberg gives a résumé of the already recorded cases.

WILSON.

- [67] **Traumatic thalamic syndrome** (Syndrome thalamique traumatique).—FAURE-BEAULIEU AND AYMES. *Revue Neurol.*, 1918, xxv (2), 10.

THE patient, a soldier, age 28, was rendered unconscious by a piece of shell which penetrated the face just below the left orbital ridge. He came under observation two months later. He complained of headache, and his speech was slowed. On examination, he presented a slight right hemiparesis. This condition was masked by the presence of choreo-athetotic movements in the right arm, which increased during excitement and were quite beyond control. He attempted to keep the arm quiet by grasping the right thumb firmly in the left hand. On voluntary movement of the right arm the limb became grossly ataxic. The right leg showed definite evidence of loss of co-ordinative power.

On the right side the tendon reflexes were brisk. No clonus. Normal plantar reflex. Babinski's second sign (combined flexion of pelvis and thigh) present. Abdominal and cremasteric reflexes normal. There was deficient perception of all forms of superficial sensation (touch, pain, heat, cold) on the whole of the right side with the exception of the abdominal and inguinal regions. Vibratory sense was absent in the right arm and leg; there was also complete astereognosis. Sense of position was unaffected. Special senses were undisturbed. The chief subjective sensory disturbance consisted of severe pain in the right hip and shoulder. This tended to occur in severe paroxysms, especially after any period of immobility.

The position of the piece of metal causing the injury is shown in a diagram. It lay a little above and behind the sella turcica and slightly to the left of the mid-line (i.e., in the position of the left basal ganglia).

Symptoms such as these have been shown previously by Dejerine and others to be due to a lesion of the posterior and inferior portion of the external nucleus of the thalamus. Usually the patient with the thalamic syndrome presents an exaggerated response to painful and thermal stimuli, but apparently no such condition was observed in this case.

W. JOHNSON.

- [68] **Syndrome of Babinski-Nageotte; the cerebellar and vestibular disturbances, the sensory disturbances** (Syndrome de Babinski-Nageotte; les troubles cérébelleux et vestibulaires, les troubles sensitifs).—DESCAMPS AND QUERCY. *Revue Neurol.*, 1919, xxvi, 187.

AFTER a brief survey of the literature of this syndrome (that of the posterior inferior cerebellar artery), the authors report a new case, with

exhaustive details. The patient, whose illness began suddenly with vertigo, stumbling, and vomiting, three and a half months before the first detailed examination, at once attracted attention owing to his constant right lateropulsion. At rest there was no abnormal sign; but, on standing, the patient showed a tendency to fall to the right, and on walking displayed a curvature of the trunk with the concavity to the right, and a constant deviation from the line of march, also to the right. There was a constant, slight, conjugate deviation of the eyes to the right on forward fixation, corrected automatically by a compensatory rotation of the head in the opposite direction. Appropriate tests revealed signs of a lesion of the vestibular nerve on the right side. Signs of cerebellar disease were present, all on the right side of the body.

In addition, there appeared a light oculosympathetic paresis on the right, which was followed by anaesthesia of the right cornea, and later by hypo-aesthesia of the mucous membranes supplied by the right trigeminal; the sensibility of the skin being affected later, and then mainly in the distribution of the ophthalmic division. Signs of implication of the vagal nucleus were limited to a slight asymmetry of the soft palate.

Examination of bodily sensation revealed no abnormality until the end of several weeks, when the patient began to complain that his left side felt cold, and hypo-aesthesia to heat and cold on this side was established. There were no signs of involvement of the pyramidal fibres, or of those conveying deep sensation.

In a brief discussion of their case, the authors point out that the dissociation of the crossed hypo-aesthesia must be due to a lesion limited in its sensory effects to the spinothalamic fibres as they lie behind the olive. The syndrome, in fact, is that of a posterolateral lesion of the medulla, and the frequency of temperature anaesthesia in bulbar syndromes may possibly be explained by the fact that, of patients with bulbar lesions, it is those with the syndrome of the posterior inferior cerebellar artery who most commonly survive.

A diagram is given to illustrate the anatomy, and there are several references to the literature.

C. P. SYMONDS.

- [69] The syndrome of disorientation in space following deep wounds of the frontal lobe (*Syndrome de désorientation dans l'espace consécutif aux plaies profondes du lobe frontal*).—PIERRE MARIE and D. BEHAGUE. *Revue Neurol.*, 1919, xxvi, 13.

VARIOUS defects have been noted in frontal lesions, such as mental changes, ataxia, apraxia, dysarthria, and so on; but it can still be said without exaggeration, that so far there exists no true symptomatology of the frontal lobes. It seems to the authors, however, that deep lesions of these lobes give rise to a special clinical syndrome, characterized by defects of orientation in space, in cases with no signs of disease of the brain or vestibular apparatus. In some cases the trouble is so gross that the patient complains of his inability to find his way about; in others careful tests are necessary to unmask it. This is done by rotating or otherwise altering

the position of the blindfolded patient, and then causing him to point to objects whose situation he had previously noted. Controls were made with healthy men, and with men wounded in other parts of the brain: they showed no impairment of this function, whereas every patient with an extensive wound in the frontal lobe made mistakes, and the defect seemed to be proportional to the extent of the lesion. It is not necessary for both lobes to be affected, and the side of the lesion is immaterial, as is the direction of rotation in making the test.

The syndrome only appears when the lesion is extensive enough to affect the greater part of the fibres leaving or entering the cortex of the frontal convolutions.

W. J. ADIE.

[70] **Gunshot wounds of the scalp, with special reference to neurological signs presented.**—GEOFFREY JEFFERSON. *Brain*, 1919, xlii, 93.

THE writer draws attention to a series of cases in which signs of injury to the brain following scalp wounds varied from mild concussion to actual contusion, with apparently slight head wounds. The paper deals largely with the motor symptoms, and was written before Head's paper on cerebral sensory functions was known to the writer. Contusion of the brain was detected in 17 cases out of 54. The motor and visual evidence was most sought, so that it is likely a larger percentage would have resulted from sensory and other investigations. General signs and symptoms found were: unconsciousness, headache, giddiness, nausea and vomiting, increase of tendon-jerks, and clonus of an unsustained character. Contusional changes: the standard for a contusion diagnosis ranged from increase locally of tendon-jerks, as compared with the healthy side, to true Jacksonian epilepsy.

The chief emphasis in the paper is that apparently trivial scalp war wounds frequently result in relatively grave cerebral lesions at the same time, though these may pass off later on.

J. LE FLEMING BURROW.

[71] **Syphilitic neuroretinitis.**—H. V. WÜRDEMANN. *Amer. Jour. Ophthalmol.*, 1920, iii, 1.

THE author enumerates the distinctions between choked disc and syphilitic optic neuritis or neuroretinitis. In the latter there may be no visual complaint, the lesion being discovered incidentally. The swelling is never more than 2-3 D. in contrast with that in papilloedema. The result may be: (1) Complete resolution; (2) Secondary atrophy. The cause is the setting free of some spirochaetal toxin in the optic nerve itself, attended by true inflammatory changes in the blood-vessel walls extending to the neuroglia, causing exudation, infiltration, and hæmorrhages, and, later, proliferation of the mesoblastic tissues of these structures.

The treatment is urgent, and is that of the cause: it consists in eliminating the poison from the system before the local action has produced an inflammatory infiltration round the nerve fibres, by massive doses of specific medication (salvarsan and mercury), aided in severe cases by diaphoresis and purging, and with dark glasses to protect the eyes from strain.

The author has seen no ill results upon the eyes from the effect of therapeutic doses of arsenic when in the form of salvarsan. Rabbits inoculated by him and J. A. Johnson with arsphenamin showed no ocular lesion after four months. He advises complete specific treatment in every case in which luetic lesions are found by incidental ophthalmological examination.

M. A. BLANDY.

- [72] **Familial optic atrophy with tremor and mental changes** (Atrophie optique familiale avec tremblement et déchéance intellectuelle).—S. IMAMURA and K. ICHIKAWA. *Revue Neurol.*, 1919, xxvi, 277.

A REPORT of two cases, the subjects affected being the two elder children of a family of six.

In *Case 1*, a male, dimness of vision was first noticed at 18 years and progressed for three months, after which apparently his condition remained stationary up to the date of examination ten years later. Visual acuity was reduced to ability to count fingers with the right eye at 30 cm., with the left at 50 cm. There were colour blindness for red and green, and a central scotoma of 30°–40° in each field, but no narrowing of the periphery. The ophthalmoscope revealed post-inflammatory atrophy of both optic discs, without macular changes. *Case 2*, a sister of the above patient, showed a more or less similar condition, the picture being that of Leber's hereditary optic atrophy. No abnormality was noted in radiograms of the skull. There is no specific reference, apparently, to the sella turcica. Certain mental and cerebellar symptoms were also present in the second case.

The authors, after noting that optic atrophy is not uncommon in the hereditary cerebellar ataxy of Marie, compare and contrast their cases with those of Behr and Takashima. These, twelve in number, presented signs typical of Leber's atrophy, together with those of a mild degree of pyramidal and cerebellar disease, but were all children, in contrast with the two which are the subject of the paper under review.

The authors conclude with the hope that their cases may help to link up those of Behr to the Leber group, and establish a single type of familial nervous disease to include both.

C. P. SYMONDS.

- [73] **Herpes of the face. Trigeminal herpes, and herpes of the facial nerve or otitic herpes** (Les zones de la face. Zona du trijumeau et zona du nerf facial ou zona otitique).—J. A. SICARD, H. ROGER, and A. VERNET. *Revue Neurol.*, 1919, xxvi, 15.

A SIMULTANEOUS affection of posterior-root ganglia, and of sympathetic fibres and ganglia, is common, although the classical authors are silent on this point. For example, when the lowest cervical or 1st dorsal root ganglia are affected, it is not rare to see paralysis of the sympathetic on the same side. Again, post-herpetic pains resemble in many ways the causalgias of peripheral-nerve lesions, which we know are due to sympathetic involvement. What is true for the trunk and limbs is also true

for the face, but here the anatomical arrangements lead to a disharmony in the distribution of the sensory and sympathetic effects.

At present the classifications of herpes zoster of the face lack clearness; the manifestations may be grouped as follows:

1. *Trigeminal Zona*.—(a) Complete. Vesicles in the distribution of the three roots, with participation of sympathetic ganglia causing anaesthesia of the cornea, alteration in the size of the pupil, and exophthalmos. (b) Partial. Eruption limited to one or two branches. (c) Associated. Trigeminal zona with motor paralysis of the ocular muscles or of the muscles of mastication.

2. *Facial or Otic Zone*.—(a) Complete. Vesicles on the ear and external auditory meatus (geniculate ganglion): sensory and taste loss on tongue (nerve of Wrisberg—chorda tympani): facial paralysis: diminution of hearing, subjective auditory disturbance. (b) Partial. Vesicles on ear; slight auditory troubles.

3. *Trigeminal and Facial Zone*.—Facial paralysis. Vesicles on ear and on one or more of the trigeminal root areas.

The cerebrospinal fluid penetrates the aqueduct in the petrous bone and bathes the 7th nerve, and it also reaches the Gasserian ganglion. Inflammatory processes in the ganglia may cause an increase in cells and albumin in the fluid. Cases showing this increase are more likely to suffer from post-herpetic neuralgia.

W. J. ADIE.

[74] Syndrome of the jugular (or posterior lacerated) foramen (Syndrome du trou déchiré postérieur—paralytic des nerfs glosso-pharyngien, pneumogastrique, spinal).—M. VERNET. *Revue Neurol.*, 1918, xxv (2), 117.

THE author describes twenty-two cases of the syndrome, some of which have followed the wounds of war (in which the projectile has travelled diagonally across the base of the skull), but more frequently the cause has been an inflammatory or compressing lesion. The syndrome is due to paralysis of the 9th, 10th, and 11th cranial nerves, and it is pointed out that a ready position where these three nerves can be involved by the same lesion is the jugular foramen.

The symptoms may be arranged as follows:—

1. Due to paralysis of the glossopharyngeal: difficulty in swallowing (especially solids), owing to paralysis of the superior constrictor of the pharynx on the affected side. On examining reflex pharyngeal movement, 'curtain movement' of the posterior pharyngeal wall towards the normal side can be seen. Also some loss of taste over the posterior half of the tongue on the side of the lesion will be found.

2. Due to paralysis of the vagus: loss of sensibility of the soft palate, pharynx, and larynx on the affected side, also increased secretion of saliva, disordered respiration (pseudo-asthmatic type), and troublesome paroxysmal cough.

3. Due to paralysis of the spinal accessory: hoarseness, owing to paralysis of the homolateral vocal cord. Also paralysis of the same side



of the palate, with perhaps nasal regurgitation. Some acceleration or irregularity of the pulse. Paralysis of the sternomastoid and trapezius on the affected side.

4. Due to other causes: (a) lesion of sympathetic fibres, which produces myosis and enophthalmos on the side of the lesion: (b) swelling high up in the neck owing to certain lymphatic glands becoming palpable.

Important points in differentiating the syndrome from disease in the medulla oblongata are: the absence of involvement of the 5th nerve, vertigo, disturbance of equilibrium, and paralysis of the 12th nerve, all of which are probable features of a medullary lesion. Traumatic cases and those due to inflammatory lesions (particularly the syphilitic variety), when treated, tend to improve. Examples of the incomplete syndrome are also given, and the paper is well illustrated with diagrams.

It will be seen that the author's account of the distribution of the 9th, 10th, and 11th nerves does not follow the description of the English text-books.

W. JOHNSON.

- [75] A sixteenth case of total anatomical section of the spinal cord (Sir un seizième cas de section anatomique totale vraie de la moelle épinière. Étude spéciale du réflexe cutané plantaire).—G. GUILLAIN and J. A. BARRÉ. *Revue Neurol.*, 1919, xxvi, 126.

IN a monograph entitled "An Anatomical and Clinical Study of Fifteen Cases of Complete Division of the Spinal Cord," published in 1917, the authors described in detail the symptomatology of these cases at the early stage. The duration of the illness was from several days to several weeks. Complete paralysis and loss of sensibility below the level of the lesion was associated with normal muscle tones at the beginning of the illness, absence of tendon reflexes, and preservation of the plantar cutaneous reflex in flexion; cremasteric reflexes were often present, less frequently the abdominal reflexes; in three-quarters of the cases the so-called defensive reflexes were absent, but in 50 per cent widespread reactions could be evoked by stimulating the soles of the feet: there were retention of urine and inversion of the thermic distribution in the lower limbs.

Special attention was paid to the plantar reflex, and in fourteen of the fifteen cases a response, which consisted of flexion (downward movement) of all the toes, could be evoked immediately or within a few days after the injury. Extension (upward movement) of the toes was not observed in a single case.

According to Guillain and Barré this flexor reaction is not identical with the physiological response in healthy individuals. The response is delayed, and the movement is leisurely, progressive, and regular; it is sometimes feeble, though often quite extensive. The flexed attitude of the toes is maintained for an appreciable length of time, and the return to the original position is carried out slowly. In one patient only was the response crossed.

During the short time that the patients lived, the form of the response did not materially alter. The reaction often disappeared just before death.

Their sixteenth patient was wounded by a piece of shell at the level of the 9th rib. At the time of the first examination, six hours after the injury, there was a right hemothorax and loss of sensibility and complete paralysis without hypotonia below the level corresponding to the lesion. The tendon reflexes in the lower limbs were absent, but stimulation of the sole of the foot on either side evoked distinct flexion of the toes. Movements of defence could not be evoked either by pinching the skin of the dorsum of the foot or by hyperflexion of the toes. The cremasteric reflex on both sides was present. The abdominal reflexes could not be obtained, but there was marked meteorism. There was retention of urine. The patient died a few hours after the injury. At autopsy the cord was found to be completely divided at the level of the 7th thoracic vertebra.

The authors conclude that the earliest plantar response to be obtained after transection of the spinal cord is flexion of the toes.

G. RIDDOCH.

- [76] **Autonomy of the spinal cord after complete division** (*Autonomie de la moelle consécutive à la section complète de l'axe spinal*).  
—G. MARINESCO. *Revue Neurol.*, 1919, xxvi, 257.

IN 1890 Bastian arrived at the conclusion that transection of the spinal cord in the lower cervical and upper dorsal regions resulted in permanent abolition of the abdominal and cremasteric reflexes and of the tendon-jerks in the lower limbs, the only somatic reflex reaction to persist being a slow movement of the toes in response to pricking the sole of the foot. As early as 1898 Marinesco expressed doubts as to the validity of Bastian's theory, and he now maintains that for its support certain conditions are essential: (1) The patient must live long enough to allow of the possibility of recovery of reflex activity in the isolated portion of the cord; that is to say, for a period of at least four weeks. (2) The elements of the reflex arcs, namely, afferent nerves, posterior root-cells, motor nerves, and muscles, must be intact, as proved in the case of the latter by electrical examination. (3) Where a pathological examination is made after death, it is necessary to obtain precise information on the condition of the root-cells of the reflex arcs of the patellar- and Achilles-tendon-jerks, the motor nerves to the quadriceps cruris and the muscles of the calf, and the fibres of the extensor muscles of the knee, especially those of the vastus internus.

A careful analysis from this standard is made of all the cases recorded by Bastian and his adherents, and the result shows that these observers prove only that, for the period immediately following transection of the spinal cord, reflex activity in the affected parts is almost completely suppressed and, when the reflex arcs are gravely injured, is permanently abolished.

Bastian's theory has been finally refuted by the mass of evidence accumulated during the recent war from the study of traumatic injuries of the spinal cord. A large number of cases have been recorded in which the totality of the lesion had been verified at operation or autopsy. Marinesco adds to the literature two other instances of complete division of the spinal cord.

His observations, together with the findings of Claude and Lhermitte, Roussy and Lhermitte, and Riddoch, afford incontestable proof that the spinal cord, when completely isolated from headward centres by transection in the upper thoracic and lower cervical regions, is able to recover its reflex activity after a certain period has elapsed.

His general conclusions are summarized as follows: (1) Spinal man shows autonomous reflex activity, and the spinal cord is the seat of elementary reflexes. (2) This mode of activity is inferior and does not correspond, as in the decerebrate cat, to a well-defined automatism. (3) Withdrawal of the stimulated lower limb, with extension of the opposite limb, is the vestige of a co-ordinated mechanism for walking. In man more than in any other animal the ability to walk is acquired through education of superior centres, conservation of which is necessary for the presence of postural activity in the muscles of the lower limbs, above all in the extensors. Transection of the spinal cord results in disharmony between the afferents of the reflex arcs and the efferents of the extensors, though after the initial depression of function has passed off no such disharmony exists in the case of the flexors. (4) Recovery of function in the isolated portion of the spinal cord is not due to regeneration of severed fibres, though regeneration does occur. Fibres of the posterior roots, as well as those of the white substance of the cord (Marinresco and Minca, Rossi, Cajal), take part in a regenerative process; but it is purely anatomical, and does not serve any useful purpose. Moreover, the fibres of the descending tracts show no sign of regeneration. (5) Postural tonus in the extensor muscles is permanently abolished, and primary extension reflexes cannot be excited by stimulation of the proximal part of the lower limb.

G. RIDDOCH.

- [77] A special lesion of the anterior and posterior roots in crushing of the cord from spinal fracture (Sur une lésion spéciale des racines antérieures et postérieures dans la section par écrasement de la moelle consécutive aux fractures du rachis).—J. LHERMITTE. *Revue Neurol.*, 1919, xxvi, 135.

PERMANENT abolition of deep and cutaneous reflexes in the paralyzed parts, after the phase of spinal shock has passed, may be due to several causes: (1) More or less complete destruction of the lower segment of the cord; (2) Lesions of peripheral nerves; and (3) Lesions of posterior roots. The author has observed another modification of the radicular system in two cases of complete division of the spinal cord in the dorsal region. The first patient was injured by the roof of a dug-out falling on him. He lived for two months, and the only reflex response that was obtained in the lower limbs was flexion of the small toes on the right side and extension on the left. The second patient fell from a height of three metres and was immediately paralyzed from a level corresponding to the fourth thoracic segment. Flexion of the toes could be evoked by plantar stimulation, but all other reflexes were abolished in the trunk and lower limbs. He died three days after the injury.

At autopsy complete separation of the cord was found at the level of

the lesion. The extraspinal portion of the posterior roots was swollen. Histologically the swollen parts were composed of alveolar tissue, masses of myelin in process of disintegration, nerve fibres, and vacuoles. In the dorsal region Clarke's column was displaced backwards and the central canal of the cord was distorted. Gross changes of a similar nature were also present in the anterior roots and anterior horn cells, and Lhermitte believes they are due to stretching of the spinal axis and roots.

G. RIDDOCH.

- [78] Two cases of syringomyelia or syringobulbia with nystagmus (Zwei Fälle von Syringomyelie bzw. Syringobulbie mit Nystagmus).  
—MAX LEVY-SUHL. *Monats. f. Psychiat. u. Neurol.*, 1919, xlv, 51.

THE author quotes with approval the conclusions of Leidler (*Zeits. f. Ohrenheilk.*, 1918, Bd. 76), that :—

1. Nystagmus in syringobulbia is produced by a lateral fissure in the medulla oblongata, which, usually unilateral, extends from the region of the central canal towards the descending root of the 5th nerve, and involves the roots of the 9th, the nuclei of the 10th, sometimes the nucleus of the 12th, the internal arcuate fibres, the descending root of the 8th, and rarely parts of the 7th. The fissure never extends beyond the level of the exit of the 7th nerve.

2. Nystagmus occurs when the fissure damages even a small part of the descending root of the 8th, or the fibres which pass from it to the posterior longitudinal fasciculus.

3. The vestibular reactions in these cases are normal.

4. In the rabbit, after section of the arcuate fibres to the caudal part of Deiters' nucleus, the nystagmus is rotatory : to higher parts, horizontal.

5. The findings in the rabbit and in man agree completely.

Levy-Suhl describes two cases with nystagmus and normal vestibular reactions.

W. J. ADIE.

- [79] Lumbar puncture as a factor in the causation of meningitis.  
WEGEFORTH and LATHAM. *Amer. Jour. Med. Sci.*, 1919, clviii, 183.

FOLLOWING the experimental observations that in artificial septiciemias in animals the withdrawal of spinal fluid invariably led to the development of a fatal meningitis, whereas in control animals, not punctured, meningitis did not occur, the following clinical research was undertaken :—

In 93 patients where lumbar puncture was performed to confirm a diagnosis of suspected meningitis, 38 gave a positive turbid fluid at the first puncture. In 55 cases a clear fluid was obtained, and in 6 of these a blood-culture taken at the same time gave a positive growth, 3 meningococcus and 3 pneumococcus. Of the 6 patients 5 subsequently developed a clinical meningitis, the sixth case (of pneumococcal septiciemia) went on to complete recovery. The 5 cases which showed clinical meningitis, as evidenced by subsequent punctures and post-mortem findings, seemed to develop meningeal symptoms soon after lumbar puncture, unless a previous intravenous injection of serum had been given.

The authors emphasize that lumbar puncture performed during a septicaemia is fraught with the danger of localizing the infection in the central nervous system. They summarize their work by stating that infection of the meninges occurs frequently after the release of normal spinal fluid by lumbar puncture during a septicaemia. They urge that a blood-culture be taken before lumbar puncture for diagnosis, so that the blood may be proved sterile, and danger of meningeal infection, by way of the choroid plexus, or locally by needle trauma, is at least minimized. They also stipulate that minimal amounts of cerebrospinal fluid be withdrawn for laboratory tests, and that small-bore needles be used, so that the local trauma is small, and subsequent leakage of spinal fluid into the surrounding tissues will be avoided as far as possible. A full review of the literature is quoted.

J. LE FLEMING BURROW.

[80] The diagnostic value of the varieties of the Babinski reflex (Zur diagnostischen Bewertung der Varietäten des Babinski'schen Reflexes).—BING. *Schweiz. Arch. f. Neurol. u. Psychiat.*, 1918, iii, 89.

FROM the examination of some 246 cases of spastic hemiplegia or paraplegia ('spastic syndrome'), Bing has observed, *inter alia*, the following points:—

1. In pure cerebral cases the extensor plantar response is but rarely accompanied by simultaneous contraction in proximal muscle-groups of the limb; in spinal cases, on the contrary, such contractions are extremely common: thus in 79 cerebral cases only 10 showed a contraction proximally (tensor fasciae latae, adductors, quadriceps), but of 56 spinal cases no less than 45 did.

2. Between these is a cerebrospinal group (disseminated sclerosis, amyotrophic lateral sclerosis, etc.) in which some 30 per cent of cases gave proximal contractions with the Babinski sign.

3. The phenomenon of involuntary flexor contraction (flight-reflex, shortening-reflex) is especially apt to accompany the extensor response if the lesion is any kind of compression of the cord.

4. Gordon's paradoxical reflex (toe-extension on deep pressure over gastrocnemius group) was found 27 times in 188 Babinski-positive cases: it is rarer in cerebral than in spinal cases, and appears to be indicative of slight degrees of spinal compression, in Bing's experience.

5. A crossed plantar response in extension was noted only 6 times, exclusively in unilateral cerebral cases.

6. In transverse lesions of the cord, extension of the reflexogenous zone for the Babinski phenomenon to the instep, ankle, etc., is in general a sign of the severity of the lesion: this does not, however, appear to be the case for cerebral lesions.

WILSON.

[81] Hypertrophic neuritis of adults (La névrite hypertrophique de l'adulte).—DIDE and COURJON. *Revue Neurol.*, 1919, xxvi, 825.

FIVE cases are described of peripheral neuritis beginning with distal atrophy and weakness, and slowly spreading towards the proximal segments of the



limbs. In four of the cases the symptoms started in the hands. The disease is slowly progressive. The clinical picture is typical of peripheral neuritis, viz., subjective pains with acroparæsthesiæ, wasting, weakness, slight sensory disturbances, and changes in electrical reactions. The characteristic feature is the tenderness and increase in size of the nerves, on which localized enlargements can sometimes be felt.

The etiology is unknown: the disease is not hereditary or familial, and syphilis can be excluded. Similar cases have been described by Long and Hoffmann in which, apart from the peripheral neuritis, no other evidence of disease of the nervous system was found.

J. L. BIRLEY.

- [82] **New tests in the diagnosis of sciatica** (*La flexion latérale du tronc, les manœuvres de flexion dorsale et torsion interne du pied, dans le diagnostic des algies sciatiques*).—G. BOUSSY and L. CORNIL. *La Médecine*, 1920, i, 290.

*Lateral Flexion of the Trunk*.—If a patient with sciatica stands with hands on hips, and attempts to bend the trunk, first to the right and then to the left, without flexing the knees, the movement is limited, most often towards the affected side, rarely towards the normal side. The limitation is well marked in cases with a crossed scoliosis, i.e., with the concavity towards the unaffected side.

*Dorsiflexion of the Foot*.—With the patient on his back with limbs extended, the foot is suddenly dorsiflexed. This elongates the nerve, especially the posterior tibial branch, and the patient reacts by flexing the limb at the knee and hip. He complains of pain in the calf, or along the course of the nerve. This test is useful in those cases where the pain is greatest in the internal or external terminal branches of the nerve.

*Internal Torsion of the Foot*.—When the foot is suddenly rotated inwards, pain is felt on the external aspect of the leg, and the limb may be flexed. This sign is not obtained so often as the preceding one, no doubt because the internal popliteal nerve is more sensitive than the external popliteal.

The tests have been made on many cases during three years, and have been found useful where the diagnosis was otherwise doubtful.

W. J. ADIE.

- [83] **Peripheral nerve injuries**.—G. E. PRICE, H. O. FEISS, and W. B. TERHUNE. *Arch. of Neurol. and Psychiat.*, 1919, i, 547.

This paper contains a neurological record of the methods used in caring for peripheral nerve cases in No. 1 American Red Cross Military Hospital, and a report on the results following nerve suture. The material included 857 histories of peripheral nerve injuries, and the records of 205 reparative nerve operations. The following conclusions are drawn:—

1. The musculospiral is the nerve most frequently injured in war, the ulnar nearly as often: the sciatic is next; and the external popliteal, which is fourth in order of frequency, is involved more than twice as often as the internal popliteal.

2. Following operation, the musculospiral and sciatic nerves make the best recoveries, the results in the case of the sciatic being equally as good as those of the musculospiral.

3. The condition of an injured nerve, when examined by sight and touch at the time of operation, is invariably worse than the previous clinical findings would lead one to expect.

4. When, at the time of operation, all the methods to determine whether simple liberation or excision and suture is the best procedure having been utilized, doubt still exists, excision and suture should be performed.

5. Repair of an injured nerve as early as possible should be the aim of every surgeon.

6. Patients convalescing from nerve reparation should be encouraged to use the extremity affected, for volitional effort plays a part in the return of function.

7. The more respect the surgeon shows nerve tissue when repairing an injury, the better will be his results. The nerve should be stripped and handled as little as possible, and the ends should be so approximated as to place in apposition corresponding fasciculi of the cut nerve.

The writers do not attach much importance to Tinel's sign as evidence of nerve regeneration.

R. M. S.

[84] **Brachial birth palsy and pseudoparalysis of shoulder joint origin.—**

T. TURNER THOMAS. *Amer. Jour. Med. Sci.*, 1920, clix, 207.

This paper is a plea in favour of the view, first put forward by the writer in 1911, that the type of birth palsy, known as the 'Erb-Duchenne type', is due rather to a posterior subluxation of the shoulder-joint, with a secondary lesion of the nerves in the axilla following upon inflammatory reaction, than to any trauma to the 5th and 6th cervical nerve-roots during parturition. The writer points out that the commonly accepted original views of Erb and Duchenne rest upon papers published in 1872 and 1874, and that these were based on electrical reactions of the affected muscles. The writer suggests that a series of cases electrically examined would probably dispose of the old views in favour of a shoulder-joint lesion, at least in the vast majority of cases. Much experimental detail worked out upon the bodies of still-born infants is quoted in favour of the author's views, and a paragraph on treatment soon after birth closes the paper.

J. LE FLEMING BURROW.

## TREATMENT.

[85] **The treatment of internal hydrocephalus in infants by puncture of the corpus callosum (Zur Behandlung des Hydrocephalus internus im Säuglingsalter mit dem Balkenstich).—THEILE. *Zeits. f. Kinderheilk.*, 1919, xxi, 113.**

THE method of corpus-callosum puncture, introduced by Anton in 1908, is simple, practicable, and worth trying in suitable cases. A spot about

2 cm. behind the coronal suture and 2 cm. from the mid-line is chosen for a small trephine opening. The dura being incised, a blunt-pointed cannula or sound is then pushed down between the cortex and the dura to the falx, and so to the upper surface of the corpus callosum, which is punctured, and the ventricular system thus tapped. The cannula is moved to and fro in an anteroposterior direction to enlarge the opening and ensure free communication between the ventricular and the subarachnoid spaces; it is then withdrawn and the wound closed. Theile reports one failure and one complete success.

WILSON.

- [86] General paralysis treated by intraventricular injection of arsphenamin.—I. J. SANDS. *Arch. of Neurol. and Psychiat.*, 1919, ii, 41.

A REPORT on the post-mortem findings in a case of general paralysis treated by an intraventricular injection of arsphenamin (an American substitute for salvarsan). The technique employed is not described. Mental symptoms appeared in December, 1915, and the injection was made in March, 1917. At the time when this mode of treatment was adopted, the patient was characterized as being simple, childish, and dull in speech. He wandered about in an aimless manner, was very irritable, and expansive in his statements. Articulation was defective, and he manifested unsteadiness in his gait. No amelioration of his symptoms followed, and he soon began to soil himself. He died in convulsions on June 28, 1917. The post-mortem appearances were those of a fully-developed case of general paralysis. The lesions in the left side of the brain which received the arsphenamin were more intense than those in the right side.

It is difficult to avoid the conclusion that in this case better clinical results might have been obtained had this form of treatment been adopted at an earlier period. It can hardly be expected that any form of therapy will undo destructive changes which have already occurred. Considerable interest attaches to the observation that the lesions on the left side of the brain which received the injection were more extensive than elsewhere; but it is necessary to bear in mind that in cases in which there have been both marked dysarthria and convulsive attacks, the left hemisphere is invariably more affected than the right.

R M S

## Psychopathology.

### PSYCHONEUROSES AND PSYCHOSES.

- [87] Psychogenesis in mental diseases.—C. G. JUNG. *Proc. Roy. Soc. Med. (Psychiat. Sect.)*, 1919, xii, 63.

THE materialistic dogma gives to psychiatry the general formula that diseases of the mind are diseases of the brain. The medical student becomes subjected exclusively to the influence of this formula, and thus the

psychological factor in medicine is typically under-valued. The physical factor is correspondingly over-valued. The physician is unable to understand the meaning of psychological conflict, and does not recognize sufficiently that the patient is a human being with a human psychology. This lack of psychological training is sometimes compensated later, especially amongst general practitioners, by the human experiences of life and its fundamental emotions. Jung calls attention to the fact that in ordinary medical routine work the psychological history is entirely omitted from the anamnesis, diagnosis, and treatment, whereas it is often of the first importance in the explanation of the fluctuations and relapses in illness. He points out that in asylums the most demented cases are met with, with the greatest degenerative changes, and thus the traits of organic degeneration and destruction are impressed on the student and alienist, and a prejudiced view is natural. "There are mild forms of dementia praecox which far outnumber the worst cases which alone reach the asylum. They come under diagnoses as vague and mistaken as neurasthenia and psychasthenia." The general practitioner does not realize that his neurasthenic case may be a mild form of that dreadful disease, dementia praecox.

Jung believes that the worst katatonic states and the most complete dementias are in many cases products of the lunatic asylum, brought about by the psychological influence of the milieu. "It is a well-known fact that the very worst demented katatonics are to be encountered in badly-administered and overcrowded asylums. All the conditions which would reduce a normal individual to psychical misery will have an equally baleful effect on the patient." The fact that dementia-praecox patients react to their environment shows that the disease cannot be purely organic.

In support of the importance of the psychological factor in precipitating a psychosis, he cites the instance of a patient who twice was seized with katatonic excitement. On both occasions the attack began when he visited a certain town. Analysis showed that the patient had had a memorable love adventure there which came to an unhappy end. He avoided returning to the town for several years, but as he had relations there he finally could not refrain from visiting them. In the course of six years he went there twice, and each time almost immediately fell ill owing to the fatal reanimation of his memories, and had to be confined to an asylum for a period. Otherwise he was successful in his work and did not show any noticeable trace of mental derangement.

Jung emphasizes the importance of psychological motives in causing the outbreak and development of dementia praecox. "Cases are common in which, whenever an engagement to marry, or any similar emotional event, is imminent, a renewed attack occurs." He gives several illustrations, in the course of which he lays stress on the important objective point in the diagnosis between hysteria and dementia praecox—that of emotional *rapproch* with the environment, which is deficient in the latter disorder, but exaggerated in hysteria.

[88] The classification of psychoses (Der Aufbau der Psychose).—  
K. BIRNBAUM. *Allg. Zeits. f. Psychiat.*, 1919, lxxv, 455.

THIS is an attempt to review mental disorders from a new standpoint, which shall yield a clearer and truer perspective of their relations and essential structure. It is only preliminary, and admittedly treats problems as simpler than they really are.

The writer postulates two fundamental factors: one 'pathogenetic', concerned with the intrinsic cause, which brings about the incidence of the disease in its wholly specific character, its 'so and not otherwise occurring'; the other 'pathoplastic', which comes into consideration in the development of the disease, and gives it its content, colouring, and definite shape. Under each of these headings lesser moments, which are auxiliary and of a general character, are included. Of these, 'predisposing' influence the pathogenetic, 'preforming' the pathoplastic. 'Provoking' factors, determining the actual onset of a disease, are given a lesser place, but are obviously of importance, since they decide whether a predisposed individual is to suffer or escape. Under these few heads the writer is prepared to set in order the medley of mental diseases. He takes into consideration 'outer moments' (mechanical, toxic, etc.), 'inner somatic' (endocrine disturbances, arteriosclerosis, etc.), 'biological' (constitution, age, sexual phases in women, etc.), as well as 'psychological' (experiences, influence of environment and situation), and he would bring them under the above headings in each case examined, and from their permutations and combinations account for the variety of mental disorders. Thus trauma is 'pathogenetic' for the commotion-psychosis, only 'provoking' for an epileptic, for a neurotic only 'predisposing' or—when it colours the symptoms—only 'pathoplastic'. The writer holds that a purely clinical classification is unsatisfactory, since, for example, auditory hallucinations may in one case be due essentially to repression of an aroused complex, in another to ear disease, in a third to constitutional auditory images, and only in a fourth type are they pathogenetically determined by the fundamental nature of the lesion.

Dr. Birnbaum eventually separates out three main groups of mental disorders. The first he calls 'exogenous', since pathogenetically they are related to the outside world or to physical lesions involving the body. Such are the organic dementias, in which a developed and well-knit personality falls to pieces. The second group is 'endogenous', constitutionally conditioned, and fundamentally different. Experience of war psychoses demonstrates the varying degrees of this hereditary element. Something is lacking in the personality; it has never been built up completely. Degenerates come within this group, as also alcoholics, morphinomaniacs, etc. Age plays an important part; witness the hysterical psychoses of puberty, the paranoïdal of the prime, and the depressed psychoses of the decline of life. The writer considers the simple dementing types of general paralysis and dementia præcox as the most primitive and typical of each of these groups. The other forms need the invoking of more auxiliary factors, and this complexity is progressive from the exogenous to the endogenous, and reaches its maximum in the third group, the



'psychogenous' psychoses. Here psychical agents are pathogenetic; constitutional factors fall into the background. Present and past experiences, clearly perceived, half-conscious or unconscious presentations; emotional agitations, general human and specific tendencies, habits, wishes, dispositions; events, environment and situation factors; temperament, character, and psychical make-up—all these come into play. The writer considers that future investigation should be directed to determining psychogenetic factors. Only in this way can the place of, for example, involution melancholia be decided. He claims that his way of approaching mental diseases gives a natural place to cases otherwise hard to relate, the varieties from clinical 'types' and individual peculiarities.

H. W. HILLS.

[89] **Head injuries in relation to the psychoses and psychoneuroses.**  
—R. EAGER. *Jour. of Ment. Sci.*, 1920, lxxi, 111.

THE author, who was in charge of the large mental division of the Lord Derby War Hospital, here gives his observations on all the cases of head-injury which were admitted, amounting to a hundred during his two years of office. He summarizes his findings as follows: The proportion of head injury cases that subsequently became insane is somewhere about 37.5 per cent, which is not far removed from the ratio of insane to the population in ordinary civil life. The small number of head injuries, therefore, in which mental symptoms have developed, is worthy of notice. The cases of epilepsy (15 per cent) predominate where there has been some gross cranial injury; the period of interval between the trauma and the first fit was about five months in the vast majority of cases. The intervals between successive fits were irregular. Two were cases of status epilepticus. Injuries of the parietal region were almost universally concerned. Amnesia was the predominant symptom in 12 cases; 6 were frontal injuries, and the other 6 were evenly distributed over other areas. No relation seemed to exist between the amnesia and the severity of the injury. There were 8 cases of acute hallucinatory states, and in 4 of these a definite history of sepsis. In 3 cases of mental deficiency the injury had not apparently produced any fresh symptoms, but seemed to have increased the severity of those already existing, and brought about a lower level of intelligence. A history of previous confinement in an asylum was obtained in 4 cases, but in 3 there had been over eleven years' continuous service in the army with a good character, and it seems difficult to see that hereditary predisposition was a factor of great importance. In 14 cases alcohol was an associated factor, but in 8 of these the intemperance had developed since the head injury, and it seems probable that the injury caused a lessening of inhibition. The commonest objective symptoms were a feeling of restlessness and irritability, a lack of confidence, and an inability to concentrate attention. Pain, too, was fairly constant, and usually, but not universally, referred to the site of injury. A more general application of x-ray examination is urged. It is concluded that it is impossible to group the cases in any way which will show any relationship between the mental symptoms and the site of cranial injury. Nevertheless, epilepsy is

most common where there is gross damage to the skull walls, especially in the parietal region. Consequent on cerebral injury there is a low state of mental tension, higher functions are in abeyance, and instinctive tendencies readily gain the upper hand. On analysis the existence of mental conflicts and repressed complexes is evident, speedy relief following psychotherapeutic treatment. It seems that in cases of 'traumatic psychoses' with head injury the mental symptoms are referable to psychic rather than physical causes.

C. STANFORD READ.

[90] Babinski's theory of hysteria.—MORTON PRINCE. *Jour. Abnorm. Psychol.*, 1919, iv, 312.

A CRITICAL article upon Babinski's view that hysteria is nothing but the product of suggestion, and that all the classical symptoms, such as paralysis, anaesthesia, convulsive seizures, etc., are artificially manufactured by the physician or environment, through the influence of suggestion, and are not original manifestations. The writer points out that this has replaced the original conception of Charcot and his school, and has influenced the English and French neurologists of to-day. Babinski divides the phenomena of hysteria into two groups. In the first are those phenomena which have the common characteristics of being capable of being reproduced experimentally by suggestion. Amongst these are included convulsive attacks, paralysis, contractures, tremors, choreic movements, troubles of phonation, respiration, and sensibility. These phenomena can be made to disappear by the influence of persuasion or by suggestion. In the second group he places those phenomena which are uninfluenced by suggestion. In this group are included dermatographism, which he attributes to a disorder of the cutaneous vasomotor reflexes, and also tachycardia, erythema, and hypersecretion of the sweat and other glands. The phenomena of this group can be artificially and experimentally reproduced only indirectly by the intermediary of emotion, which suggestion can excite. Once it is indirectly excited these cease to be under the influence of suggestion, which is incapable of determining their form, intensity, and duration. They are the physiological manifestations of emotion. Babinski would abandon the name of hysteria, and replace it by the term pithiatism, which is derived from two Greek words meaning respectively 'to persuade' and 'curable'. The term thus contains the idea that Babinski has concerning hysteria, which to him is "a pathological state, manifesting itself through troubles which it is possible to reproduce by suggestion with a perfect exactitude, and which are susceptible of disappearing under the influence of contrasuggestion alone". Prince points out that Babinski, once having defined hysteria as a pathological state, proceeds to give an elaborate and clever exposition of its manifestations, but ignores the primary matter, namely, that it is a pathological state. Like so many French writers when they deal with the neuroses, the intellectualization and the elaboration lead away from the main issue. "Dwelling only on symptoms he fails to grasp the essential problem of hysteria, losing sight of the pathological state and its psychogenesis, which should be the sought-for goal." Babinski's

fundamental contention is that in all cases of hysteria suggestion is the causal agency, and that there is no other known agent, including particularly emotion, that can induce the symptoms. Babinski does not understand the conception of mental conflict or of repression.

Prince takes amnesia in its various forms as one of the classical symptoms of hysteria, and discusses it in the light of Babinski's theory. He describes a case of shell-shock, which was regarded as one of insanity, but which he was able to prove to the physician was a case of anterograde amnesia. "Surely," asks Prince, "this was not suggested by the physician, who had already mistaken the character of the symptoms; and are we to suppose that the affected soldier consciously imagined and willed a symptom of so strange a kind?" Prince's arguments cannot be given in full here, but are worth reading. Babinski has set out to prove that emotion itself cannot cause hysterical troubles. He does not understand emotional conflict, leading eventually to dissociations in the psyche, but seeks for an explanation of all hysterical phenomena in suggestion, either self-suggestion or suggestion through the physician.

MAURICE NICOLL.

[91] *Simulation (malinger) not an adequate diagnosis.*—W. A. WHITE. *Jour. Nerv. and Ment. Dis.*, 1919, I, 209.

THERE are two extreme views held with regard to malingering. First is the legal attitude which convicts the person of the offence if it can be shown (*a*) that the assumption of his symptom procures the end for which he is striving, and (*b*) that, when taken unawares, the man contradicts his own symptom. The other, which may be called the psychiatrist's attitude, recognizes that, behind the majority of hastily-assumed cases of malingering, there is a real deficiency in the individual's innate mental make-up. Such abnormal mentalities are, it is admitted, extremely difficult to gauge, being much less tangible conditions than physical abnormalities; but this is no reason for completely ignoring their existence.

The author points out that most methods in use for the 'detection' of malingerers do no more than prove that the condition is not an organic disease. The question of how far it may be morbidly psychogenic is not generally considered. The individual hampered with an abnormal personality is sure sooner or later to develop a psychosis. Usually this is regressive in type, the man acting as a child would do under similar circumstances. Such cases should be treated, not by the infliction of heavy punishment, but rather by methods of education devised to supplement the subnormal mental standard which they possess.

W. JOHNSON.

[92] *The somatic causes of psychoneuroses.*—CHARLES L. DANA. *Jour. Amer. Med. Assoc.*, 1920, LXXIV, 1139.

THE author lays stress on the enormous vogue of the psyche in contemporary thought, but pleads that in disease there must be a physical as well as a psychical change. He points out that emotion or suggestion cannot produce symptoms without changes in the neural organization.

and suggests that these changes may also be produced by concussion or toxæmia, or as a result of mixed factors. After referring to Carver and Dinsley's paper in *Brain* (June, 1919), he mentions several cases, and quotes one which improved temporarily on thyroid medication, and from this concludes that psychotherapy must necessarily fail in such cases where the endocrine organs are working defectively.

He then goes on to speculate on the somatic location of the psychoneuroses, and concludes that they result from the disorganization and dissociation produced in the complicated relationship of reflex and associated paths by the occurrence of 'sick synapses'. Some synapses are blocked, some are spastic and over-tight in their connections. He concludes that if, as a result of commotion or emotion, such symptoms as hemiplegia or stutter ensue, they are due to subtle changes in the nervous system—cellular swelling, varicosity of the dendrites, blocking of synapses, neuroglial movements, or focal injury with diasthesis. These changes are not so profound but that a strong effort of will or a counter-suggestion will restore the balance.

The author's conclusions are that the psychoneuroses are organic as well as psychic conditions, and therefore that it would be disastrous if these patients were to pass from the hands of the neurologist to the psychotherapeutic specialist and then to clinical psychologists and pedagogues. The management of these cases calls for the closest observation and the most accurate study of the personality, but also of physical, metabolic, and endocrine defects. It is therefore to trained neurologists, conscious of their responsibilities and familiar with the best technical methods, that the care and the prevention of psychoneuroses belongs.

R. G. GORDON.

[93] The etiology of neurotic symptoms in a child of eight.—ADOLPH STERN. *N.Y. Med. Jour.*, 1920, cxi, 889.

THE writer remarks that it is a matter of everyday experience in the treatment of adults by analysis to find that their symptoms are directly traceable to long-forgotten and repressed interests, wishes, and impulses which belong to early life and which still possess a dynamic force, although they have become unconscious. He finds wishes in his patient of eight years of age which are identical with those found in the unconscious of the adult. In both child and adult they are important causative factors in the production of symptoms. The patient suffered from a tic involving the facial muscles, the head, right arm, and right leg. This had come on since the age of six. Up to the age of four, though somewhat timid, he was rather unrestrained in the company of elders, but showed no inclination to mingle with other children. At the age of six his parents moved to a neighbourhood where rough boys lived. At this age the symptoms began, the first of which was a cackling or crowing sound emitted on all occasions. This continued for about a year and a half, and was accompanied by the development of growling sounds. With the onset of the latter there were added blepharospasm and facial grimaces, with the tic of the head, right arm, and leg. The patient also showed a very rich fantasy-life.



His fantasies were much concerned with animals, bears, lions, and tigers, and with the question of courage. For example, "The lion is not afraid of me when I aim the gun at him. He just growls and I get scared. When I fall from the tree the lion swallows me, but when I get into his stomach I cut it open and come out and he dies." The writer traces the symptoms of the boy's neurosis to a repressed wish to identify himself with certain animals, so that he might possess their power and strength and thus be able to overcome the difficulties of his environment. The roots of the other components of the neurosis are traced out, but are too voluminous to give here.

The writer goes on to discuss the question of the factor of inheritance in his patient and in neurotics in general. Freud originally stated that the offspring of syphilitic parents are especially prone to psychoneurotic manifestations. The father of the patient under discussion was syphilitic. The author, however, doubts whether Freud would now give so much weight to syphilis in a parent as a causative factor in neurosis in descendants. Neurosis or a neurotic disposition in the parent is a more direct causative factor, but not in the hereditary sense as we are accustomed to use the word heredity. Direct transmission in an environmental sense is important, and has been recently referred to by Janet. There is no doubt whatever that when the father is neurotic, and when he sees the same traits and peculiarities in his son, they form to him a constant source of humiliation, irritation, and anger. In this particular case the father of the patient had been very neurotic, and when he saw the same traits appearing in his child he sought to cure the boy by beating and shaming him out of it. The writer considers that this was a factor in the causation of the neurosis of greater importance than the heredity factor. He observes that we are prone to ascribe to heredity many things that are environmental causes in the production of the neurotic constitution. He has noted with those children in whom fear is a well-developed manifestation in their psychology, that the parents as a rule show a pathological anxiety about life and are unduly irritable. An irritable father or mother is one of the greatest dangers to children, even in the first months of life, as various instinctive reactions are aroused. The primary instincts and the primary emotions are inherited, but the early environment has much to do in deciding the manner of reaction of the individual to these primary emotions and instincts.

MAURICE NICOLL.

[94] Chronic hallucinatory psychosis.—R. H. STEEN. *Jour. of Ment. Sci.*, 1920, lxi, 99.

THE author attempts here to prove that there are certain hallucinatory cases which can be grouped together to form a well-defined clinical entity under the above heading. Five cases are given as clinical illustrations. Most of the writer's cases have been women between the ages of thirty and fifty, and a strong hereditary tendency to nervous instability was found. There is no known morbid anatomy, and the condition is best understood if approached from the purely psychical side. After some



mental uneasiness, auditory hallucinations suddenly appear. These are first recognized as 'imaginary', but later insight is lost, and finally delusions are formed to explain them. Hallucinations may involve all the senses, but auditory are most frequent and visual least so. The voices convey obscene and blasphemous messages. Insomnia is not prominent, emotional excitement rare, and depression slight, though in the later stages violence may be threatened and suicide suggested. The first stage with insight may last even years. Remissions and exacerbations are seen. The question of differential diagnosis is discussed, the conditions of chronic hallucinatory insanity of alcoholic origin, dementia præcox, and paranoia being here of importance. Reference is also made to the Lasègue-Fairot syndrome, Magnan's *délire chronique*, and Kraepelin's paraphrenia. With regard to treatment, little faith is placed in drugs. A mental examination should be made, and psycho-analysis may be necessary.

C. STANFORD READ.

[95] **Psychical disturbances in tabes** (Ueber psychische Störungen bei Tabes).—BRODNIEWICZ. *Allg. Zeits. f. Psychiat.*, 1919, LXXV, 701.

MENTAL symptoms are not infrequently found in cases of tabes which show none of the accepted signs or symptoms of general paralysis. Brodniewicz reports three cases in some detail. Tabetic psychoses are of two sorts: (1) Acute transient disturbances of the nature of a crisis (cf. visceral crises); and (2) Longer psychoses of a paranoid nature. Under the first come cases where the phenomena are hallucinatory-delusional, as in a toxic psychosis; in the second they are commonly hallucinatory-paranoid. Brodniewicz's two chronic cases, however, were rather akin, clinically, to an obsessional type. The author's conjecture is that the psychoses are due to acute or gradual impairment of cortical function by toxins or by the spirochaetes themselves.

WILSON.

## PSYCHOLOGY AND PSYCHOPATHOLOGY.

[96] **Instinct and the unconscious.** Contributions to a symposium. *Brit. Jour. Psychol.*, 1919, x, 1.

W. H. R. RIVERS uses the term unconscious as "experience which is not accessible to consciousness except under certain special conditions, and yet is capable of influencing consciousness and conduct indirectly in various ways". He regards instinct as a function of the subcortical centres, and emphasizes its being subject to the 'all-or-none' principle, its other psychological properties being its crudeness and vagueness of spatial reference and its immediacy and uncontrolled character of response. He raises the question whether 'protopathic' and 'epieritic' might not be more scientific terms to use in the place of 'instinct' and 'intelligence', following out Head's physiological work. More than the 'all-or-none' principle is seen in the reactions of insects, which show some discrimination and graduation of response. Hence his thesis is that the early forms of 'all-or-none' reaction, together with the experience associated with them, are incompatible with

the later developed graduated reactions, so that the former are suppressed or dissociated, thus forming the unconscious. Nature did not simply modify the earlier process, but developed a new mechanism which utilized such portions of the old as suited its purpose, and suppressed the rest. The older and dissociated forms of reaction only emerge when the later developed and controlling influences are in abeyance, as in sleep and hypnotic states. The instincts connected with the needs of the individual will be mainly protopathic, while those subserving the welfare of the group will be mainly epicritic.

CHARLES S. MYERS discusses reflex action, and finds it difficult to accept the 'all-or-none' argument of Dr. Rivers except as a reaction to a first experience. He maintains that there is not one nervous apparatus for instinct and another for intelligence. Only from injury or disease can the thalami act independently of the cortex. Instead, then, of regarding intelligence as something added later to instinct, he regards both as differentiated out of a *common origin*. Abstract instinct and intelligence, though neurally differentiated, are inseparable in the intact organism and occur as a composite unity. The protopathic element is 'fused' rather than 'dissociated'. Dr. Myers cannot agree that what is dissociated in any conflict between instinct and intelligence consists merely in the protopathic characters of the former. Loss of control is not to be confused with protopathic reaction. The dreaming or hypnotized person exhibits graded instincts. When instinct and intelligence are opposed, fusion and integration, instead of dissociation and repression, may well arise from their compresence.

C. G. JUNG also cannot rely on the 'all-or-none' principle in defining instinct, and points out that a great number of conscious processes when examined show an intensity inappropriate to the intensity of the stimulus, and it therefore seems necessary to use some other criterion for the psychological definition. Psychological phenomena are not infrequently met with very similar to instinctive activities, but not to be understood as such—phobias, obsessions, sudden moods, compulsive emotions, etc. Only those processes can be called instinctive which are inherited, unconscious, and uniformly and regularly occurring everywhere. They must also show the mark of compelling necessity like a reflex, from which they are distinguished by their complicated nature only. Just as instinct is the intrusion of an unconsciously motivated impulse into conscious action, so intuition is the intrusion of an unconscious content of an 'image' into conscious apperception. The conception of the unconscious becomes an integral part of the instinct problem, and he defines it as "the totality of all psychic phenomena that lack the quality of consciousness". He differentiates a 'personal unconscious' which contains the acquisitions of the individual life, in opposition to another form, the 'collective unconscious', containing the 'supra-individual' qualities which were not acquired but inherited. We are far more capable of observing and judging of instincts in animals or primitive man than in ourselves, and there is no doubt that the instincts of civilized man have become considerably modified; but underneath instinct remains as the motive nucleus. Human actions are influenced by instinct to a far higher degree than is usually admitted. It is

questionable whether man possesses many instincts or only a few, so it is doubtful whether he possesses many primordial forms or archetypes of apprehension or not. The way in which man conceives the world is still, in spite of manifold variations in detail, as uniform and as regular as his instinctive actions. Just as our conscious conception determines the form and purpose of our conscious action, so unconscious apprehension determines through the archetype the form and purpose of instinct. It is quite easy to discover intuitional activity in primitive peoples. The collective unconscious consists of the sum of the instincts and their correlates the archetypes. The most striking evidence for the existence of archetypes is seen in mental derangements characterized by an intrusion of the 'collective unconscious' into the conscious, as occurs in all paranoid and hallucinatory psychoses.

GRAHAM WALLAS argues that 'suppression or dissociation' is neither the only nor the most effective way by which civilized man gains control over his instincts. Bringing into full consciousness the psychological phenomena of fear is a better process than a thrusting of them into the unconscious. Our consciousness of and separation of our 'self' from our instinctive feelings, and therefore our power of controlling our actions in their presence, may be increased in efficiency, not only by our expecting and recognizing them, but also by our understanding them—that is to say, by our giving them a place in our general conception of cause and effect.

JAMES DREVER does not see his way to accept the suggestion that the term 'unconscious' should be in the main restricted to abnormal phenomena of the dissociation order, or rather that such phenomena are necessarily abnormal. 'Psychical' includes facts of at least two distinct kinds, those of the order of 'dispositions' and those of the order of 'experiences'. What kind of experiences can we include under the unconscious? Are there experiences apart from the 'marginal' which the psychologist can admit as in any sense unconscious? Consciousness is 'psychical integration', but in addition psychical life presents 'synthesis' in varying degrees. An unconscious which is really unconscious, apart from the disposition, does not appear to be psychical at all. The unconscious is regarded as 'subpersonal consciousness', including, in so far as it is experience, purely perceptual or even subperceptual experience. Instinct is determinate conscious impulse which is not determined by previous individual experience, but which nevertheless enters into and determines individual experience and attitude. External behaviour can never furnish us with an ultimate psychological criterion, though the 'all-or-none' kind of behaviour is worthy of the most careful attention, and instinctive behaviour will always in a certain sense be of this type. The pleasure-pain and reality principles are mentioned, and attention is drawn to the fact that the distinction between appetite and instinct rests on a somewhat similar basis. It is desirable to recognize different 'strata' in psychical life, and an evolutionary interpretation is almost inevitable. Pure original instinct will not be found after 'intelligence' has once functioned. His conclusion is stated as follows: "The unconscious or subpersonal consciousness underlies at all times the conscious or personal consciousness, just as the instinctive

propensities underlie the ends and purposes of our rational activities, and it is unconscious because it represents either a stage of psychical evolution beyond which we have passed by normal development, or a mass of experience upon which we have, as it were, tried to turn our backs by some more or less abnormal process of dissociation, repression, or substitution; but instinct has precisely the same psychological position and function in subpersonal as in personal consciousness."

W. McDougall finds it very difficult to believe that the 'all-or-none' principle holds good of the single nerve fibre or neurone, and seems to hold good as little of the instinctive reactions. It seems to be roughly true that the instincts belong to the 'protopathic level', but we must not go beyond this general statement. The 'unconscious' is commonly used to denote facts of two distinct orders: (1) The facts of mental structure; (2) Mental activity of which the subject is not clearly conscious. We are then discussing two distinct problems: (*a*) The relation of instinct to the innate structure of the mind; (*b*) The relation of instinct to unconscious mental activity and to the mental structures involved in such activity. The innate structure of the human mind comprises much more than the instincts alone, and there are indications of a considerable development of it on its cognitive side; but there are many facts which compel us to go further in the recognition of innate mental structure. The instincts are but a part of it, but a very special part, and the suggestion is made that they differ from the rest not only in that they are the great channels of conative energy, but also in that the nervous and bodily structures through which they operate are also innately laid down, whereas for the rest of the innate mental structure no such bodily organs are given. The truth of the developmental view of mind is assumed. Dr. McDougall protests against Dr. Rivers' use of the word 'experience', which should be used to denote conscious mental activity instead of that which is retained by the mind in consequence of experience, and regards Dr. Rivers' view of the relation of instinct to the unconscious as seriously in error and as illustrating the neglect to distinguish between activities and dispositions. Both he and Dr. Jung have not set out clearly what we mean by instincts, what instincts we recognize in man, what is their nature, what the structure and mode of operation of each instinct that we conceive to play any such part. It is doubtful if we should identify 'dissociation' and 'repression'. The synthetic unity of self-consciousness is achieved only on the ideational level of mental life. The purely instinctive activities are subpersonal, and are mutually exclusive in so far as their ends are incompatible. With the development of ideational life the instincts become organized in systems, and with the development of self-consciousness become only subordinated within the one all-comprehensive system which is the 'character' of the individual man. This organization is effected through the interrelation of cognitive dispositions with which the affective dispositions of the instincts have become connected through experience. When any experience issues in a strong affective reaction which is opposed to the self-conscious character there is conflict, which may result in the dissociation of the cognitive dispositions concerned in that experience. If such



becomes dissociated it retains its connection with the affective disposition of the instinct and is capable of functioning as an isolated system. It may then lie quiescent, or may from time to time be roused to life manifesting its affective-conative tendencies. The instinct itself, or its affective disposition, retains its connection with other cognitive systems, is not dissociated, and therefore continues to play its part in personal consciousness and activity. Dr. McDougall can see no evidence of discontinuity in mental evolution. The human instincts are not suppressed by new forces and incompatible modes of mental activity. The instinctive forces are modified and controlled, but without ceasing to be the mainspring of all our thought and conduct.

C. STANFORD READ.

[97] 'The 'nervousness' of the Jew.—A. MYERSON, *Mental Hygiene*, 1920, iv, 65.

THE writer, himself a Jew, analyzes the causes of the exceptional liability of the Jews to psychoneuroses. He points out that it is a 'cheap solution' to say this liability is due to heredity, in the sense that there is an innate predisposition. Rather is heredity to be understood in the sense that there has been an adverse environment from generation to generation, viz., persecution and the resulting limitation of the possible range of contact with life. This impoverishment of modes of expression is synonymous with a damming-up of the libido, which is accompanied by apprehensiveness and emotionality.

Thus is developed the thesis that, although biological heredity is important in the study of nervous disease, social heredity, as the writer terms it, is more important in the case of the Jews. By social heredity is meant that groups of life-factors may be handed down for generations, and may influence the life of every individual in the race as potently as if a change had occurred in the stock. The writer is, however, fain to admit that the Jew has an innate character different from that of the other races, which perhaps predisposes him to psychoneuroses and other mental diseases; that he clings to belief and opinion with a tenacity unparalleled in the history of the world; that in point of intellectual achievement he is to be compared only with the great races of the world; that he is curiously passive in his resistance, and curiously indomitable in his hold on life and success. Nevertheless, the author insists that, in the face of what we know about the life-factors of the Jew and of the extraordinary changes that have taken place in his character in the last generation, no surmises as to an innate character or tendency to neurosis are permissible. Thus racial character is regarded in terms of social heredity.

This contention is supported by the fact that, with a fostering environment in America and the free countries of Europe, the incidence of neurosis in the last generation of Jews has been strikingly decreased. It is implied therefore that the Jewish character and attitude towards life in the past, in so far as it has been the genetic background of the neuroses, has been itself a neurotic reaction. In this connection the writer makes the suggestion that the liability to arteriosclerosis and diabetes that exists among



the Jews may be looked upon as a physical component of this neurotic reaction, and that these structural changes have been engendered by persistent pathological fear-emotions, presumably through the agency of the endocrine system.

He acclaims the fact that the intensely religious character of the Jew has disappeared in America, as if by magic, and appears to regard the fact that the Jew has given up his kosher, his Sabbath, and his traditional religion in general, as evidence of amelioration of the neurotic reaction. What persecution could not do throughout the centuries, toleration has done in a generation.

JAMES YOUNG.

- [98] **Criminality and hysteria** (Beitrag zur Frage Verbrechen und Hysterie).—RITTERSHAUS. *Allg. Zeits. f. Psychiat.*, 1919, lxxv, 720.

THE question of the development of criminal tendencies in the course of a hysterical 'twilight state', or actual fugue, is one of considerable scientific and practical importance. Rittershaus reports at great length, and mainly in the patient's own words, a striking case of this description. The man, a Hungarian civilian, resident in Belgium, became a railway clerk during the German occupation, and one day suddenly began a career of crime, consisting in theft, robbery under arms, falsification of his identification certificate, swindles in connection with collections for Belgian prisoners of war, and so on. Arrested and imprisoned, he declared he had no idea how he could have done such things, and adduced evidence to show he had often had 'attacks' of sudden onset in which he forgot everything, left home, and wandered aimlessly over the country. He had frequently threatened his own and his wife's life in theatrical fashion, but whenever the latter called out "That's enough!" he at once ceased. Rittershaus comes to the conclusion that epilepsy, manic-depressive insanity, and insanity-simulation can be excluded, and that the case is one of severe 'degenerative hysteria'. The patient had frequently been imprisoned without its making any change in his manner of subsequent living: he was accordingly certified as suffering from a condition as a result of which he could not be held responsible for his criminal acts, and he was eventually sent to an asylum in Austria.

WILSON.

- [99] **Suggestion and suggestibility**.—E. PRIDEAUX. *Brit. Jour. Psychol.*, 1920, x, 228.

THERE is much disagreement as to the meaning of the word suggestion, and definitions can be roughly divided into two classes according as they refer to normal or abnormal suggestion. The views of Janet, Babinski, Bernheim, and McDougall are referred to, and the author thinks that, as the definition of the last named excludes auto-suggestion, it should instead read: "Suggestion is a mental process resulting in the acceptance with conviction of a proposition in the absence of logically adequate grounds for its acceptance". If there are logical grounds for acceptance, the idea is generally called persuasion. The chief factor in suggestion is *suggestibility*, which is subjective and the result of affective processes. (1) *Individual*

*suggestibility* varies. It is exaggerated in the child, in old age, in those with marked egoistic instinctive tendencies and who act on impulse, in crowds, in those who live in warm climates, in those who associate more by contiguity than by similarity, and in patients with conversion-hysteria. It is less marked in those who have strong ideals and in the 'introvert'. Exaggerated suggestibility is always associated with a low 'emotive response', as shown by investigations on the 'psycho-galvanic reflex', which may, however, indicate the strength of the 'epieritic' forces stimulated by the liberated emotion. We can explain individual suggestibility as due to the varying degree in which the egoistic instinctive tendencies are developed, and the manner in which the sentiments have become organized to form ideals and act as contrary forces. (2) *Conditional suggestibility* has relation to the affective state of the person. Increase is seen in hypnosis, fatigue, illness, and prolonged emotional states, and is aided by alcohol and certain drugs. Each person has his own particular sphere of suggestibility. There is thus a (3) *Specific suggestibility*. Pleasing ideas, and those which satisfy his egoistic instincts and tendencies, render an individual specially suggestible. There is, too, a (4) *Personal suggestibility* depending on the affective processes operating between two persons. Authority and prestige are effective, and the instincts of self-assertion, subjection, and sex are much involved. The Freudian views as set forth by Ferenczi and Jones, viz., that suggestion is a special variety of transference, and that suggestibility has its root in the masochistic component of the sexual instinct, are mentioned.

The response to suggestion may be positive, negative, or neutral. With regard to positive response, it is insisted on that suggestion has no capacity for inhibiting ideas, and that an idea is accepted because it harmonizes with some preformed interest or complex, and that affective forces reinforce and produce conviction. Anything that dissociates a suggestion from the herd will tend to ensure its rejection. Negative response is seen when the factors just mentioned are contrary. Negativism may be exaggerated and pathological, as seen in dementia praecox. A neutral response will be due to the lack of complexes to which a suggested idea may attach itself, but may also be due to a conflict of motives and a state of doubt. The process in abnormal suggestion only differs in degree. Suggestion is not regarded as an innate tendency. Therapeutic suggestion is briefly discussed. It is not looked upon as an ideal method, but as very useful in practice for the removal of symptoms in certain cases.

C. STANFORD READ. .

[100] Left-handedness in epileptics, mental defectives, and normal individuals (Ueber Linkshändigkeit bei Epileptischen, Schwachsinnigen, und Normalen). GANTER, *Allg. Zeits. f. Psychiat.*, 1919, lxxv, 689.

From statistical investigation among the inmates of an institution in East Prussia the following conclusions are arrived at:—

1. *Percentages*.—Male epileptics, 28.7 per cent; female, 15 per cent. Male defectives, 18.2 per cent; female, 19.4 per cent. In the relatives of

these two groups: 45.9 per cent in epileptic families, 45.8 per cent in mental-defective families. According to the author's researches, percentage of left-handedness in normal families, 27.9 per cent.

2. *Pathogenesis*.—In most instances left-handedness is a stigma of degeneration. There is no connection between it and the condition of the reflexes, nor between it and the weight of the hemispheres. In 67.1 per cent of right-handed persons, and in 70.6 per cent of left-handed persons, the *right* hemisphere is heavier than the left. Right- or left-handedness depends simply on functional predominance of one or other hemisphere.

WILSON.

[101] Should the plea of insanity as a defence of an indictment for crime be abolished?—C. F. MACDONALD. *Amer. Jour. Insan.*, 1920, lxxvi, 295.

THE writer points out that the introduction of the psychopathological side into law leads to great complication. The question of abnormal psychology has frequently arisen of late in English law courts, and often the plea of war neurosis has been put forward. Immediately the question of abnormal psychology becomes of paramount importance in judging between the parties or sides, it is obvious that a very difficult and complicated situation arises, which medicine in its present stage of development along the line of psychopathology is scarcely capable of dealing with adequately. The present writer suggests that the question of insanity should be kept entirely out of the case during the trial, and the jury should only pass sentence upon the question of the guilt or innocence of the accused, quite irrespective of his mental condition. Then, if the conviction is brought about, the court should appoint a commission of competent alienists to determine the prisoner's mental condition, and if he is punishable by reason of mental disease or not. This would seem certainly better than having to prove to a jury that a patient was mentally affected or otherwise: but on the other hand it lays grave responsibilities on the commission of competent alienists. Nowadays a commission of competent people is always a panacea for every difficulty, but, alas, where are they to be found?

MAURICE NICOLL.

[102] The psychomotor function of inhibition as studied in a case of Huntington's chorea (La fonction psychomotrice d'inhibition étudiée dans un cas de chorée de Huntington).—MOURGUE. *Arch. Suisses Neurol. et Psychiat.*, 1919, v, 70.

As a basis for this interesting communication, Mourgue assumes the universal applicability in Huntington's chorea of the pathological findings of Marie and Lhermitte, according to which there is a selective action of the degenerative process on the frontorolandic cortex and its projection-fibres, and on the putamen and caudate nucleus (neostriatum), though it may be remarked incidentally that such a schematization of the lesion needs further corroboration before it is likely to be generally accepted. Be this as it may, Mourgue relies on the unsatisfactory experiments of Pagano, who stated that excitation of the caudate nucleus produces signs of automatic irritability in

the dog, to correlate the irritability of the Huntingtonian with disease of the nucleus, assuming, apparently, that excitation and degeneration give rise to identical symptoms, and that experimental results in the dog are applicable to man. Next, it is assumed that corticostriate fibres exercise an inhibiting action over the functions of the corpus striatum, so that with degeneration of the former the caudate nucleus is 'liberated', yet it is well known that the existence of corticostriate fibres is more than problematical.

Mourgue, however, sees in this assumption an explanation of the mental symptoms of Huntington's chorea; emotional activity is no longer under control because of failure of psychomotor inhibition. Of greater interest, because less debatable, are the author's observations, by the tests of the psychological laboratory, on the exteriorization of the emotion thus 'set free'. He finds, as a fact, that it is not accompanied by the usual somatic phenomena, that the Huntingtonian's irritability, etc., is of endogenous, not exogenous, origin, and that lessened ability to react to external emotive stimuli is due to his state of more or less continuous distraction. In Maudsley's words, "Who cannot control his muscles is incapable of attention". Mourgue suggests ingeniously that the absence of somatic phenomena normally accompanying emotion is proof of the existence of a sympathetic centre of representation at least as high as the regio subthalamica and of the affection of this centre in the disease. The inattention of the Huntingtonian and the instability of his psychomotor reaction are also well seen in Mourgue's studies of his reaction-times. WILSON.

[103] *The neuroses of peace.*—JAMES HENDRIE LLOYD. *Arch. of Neurol. and Psychiat.*, 1920, iv, 1.

THE neuroses of war have been rapidly replaced by the neuroses of peace, and, as the writer observes, it is apparent that the dangers of peace may be even greater than the dangers of war from the psychological standpoint. Dean Inge recently stated that Western civilization had received a mortal wound in the Great War, his idea being that the human race in the West can no longer bear the burden of mechanical and industrial civilization. The brutalizing effect of the late war raised up the primitive savage in man which is only beneath the skin, and he will not go back properly beneath the skin again, partly because the life of civilization is so complicated and so difficult. As a result there is a kind of traumatic neurasthenia that has laid hold, not only of individuals, but of large masses of people. We are faced by a dangerous period in the world's history, because Western humanity is neurotic and even psychotic as regards its mass reaction in crowds. Pandemic psychoses, mental contagion on a huge scale—working upon an underlying collective paranoid condition—may lead anywhere. The writer believes that prohibition is a pandemic hysteria, and that it is not really based upon true roots. A tremendous suggestibility is one of the evidences of a collective neurosis. "We are in danger of being swept into some millennium before we know it, and I know of no worse fate than to wake up some fine morning and find oneself in a millennium. It would be a sort of league of hallucinations, in which even the most expert neurologist might find it difficult to find his way."

MAURICE NICOLL.



## TREATMENT.

[104] Extending the field of conscious control.—WILLIAM A. WHITE.  
*Psycho-analytic Rev.*, 1920, vii.

THE only possible way to remedy abnormal conduct arising from neurotic disease is to bring the motive of the individual into the field of consciousness, as a preliminary step at least to changing the behaviour. Thus we may discover the tendencies behind the conduct in question, and then control and redirect the energies. This is what is meant by extending the field of conscious control, which is the principle at the basis of the psycho-analytic approach to psychotherapeutic problems. A most common way in which unconscious tendencies lead astray is by the projection of a wish. The conquering of our environment is made possible only by an increase in our knowledge of that environment: but mental hygiene concerns itself with a different aspect of the enlarging of the field of conscious control. An individual's reaction in any particular situation is not alone determined by the factors of the situation itself, but the sum total of his previous experience which relates him to it, and for most of which he is quite unconscious. Thus a bias and a prejudice born of the unconscious colour all our problems, and the essence of mental hygiene is self-knowledge. Our instincts are bound to get expression in some way sooner or later, and, if we are not capable of understanding their promptings, then they gain expression by some devious pathway and parade as something which they are not. Physicians must no longer be content to leave the personality out of the scheme of their attempts to understand illness, and every physical symptom must have its reverberation in the mind of the patient. Mental reactions are as definitely determined and as reasonable as physical and physiological reactions. Evolution has been, among other things, the result of an increase in the capacity to bring the instincts under the domination of the intelligence. White thinks that various physical ailments which come more nearly within the conception of organic disorders, but which may well at first be purely functional, and at present are most baffling to our understanding, may receive much illumination if we view the human machine as a whole. If an individual approaches the problem of his life with a divided interest, he must constantly be utilizing his energies for different and often mutually opposed ends. Hence the machine will be set for certain types of reaction which are not permitted to come to pass. These motor sets of the organism will produce tensions of the voluntary and visceral musculature as well as psychological tensions which, when long continued or severe in character, tend to break down the machine. Energy which is used in the service of repression shows itself in the friction with which the machine works and the consequent wear and tear of its several parts. Evolution is not always slow and uniform in progress, but at times advances by the sudden creation of something new. The author looks upon the new psychology as a new instrument with which to attack the problem of living.

C. STANFORD READ.



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## Original Papers.

### PSYCHOLOGY AND THE MEDICAL CURRICULUM.

BY PROFESSOR C. LLOYD MORGAN. BRISTOL.

Has not the time come for considering the advisability of introducing psychology into the curriculum of our medical schools, at some period of study, for some students if not for all?

I suppose everyone admits that there is close and intimate connection between mind and body. And I suppose that, not so very long ago, the common attitude in this matter among those with whom we are now concerned was something like this: When specific cerebral processes reach the requisite level of intensity or complexity, or both, there is an accompaniment of consciousness. This is just an interesting effect that is produced by purely physiological causes. It is for psychologists to study these effects. We are concerned with causes; and they are always and in all cases physiological. No doubt in popular speech we talk of the mind as influencing the body; but translated into scientific terms this means that certain cerebral changes are influenced by, and in their turn influence, other changes in the body.

I do not, of course, suggest that the mid-Victorian physician took no account of mental symptoms. But I do suggest that they were very often regarded as *indications* of disorder in the nervous system, so that their causal origin was there to be found, if found at all. Just as the physicist may see, in the phenomena of colour, advertisements of so many electromagnetic pulses per second, and yet hold to the belief that colour as such is non-causal and does nothing; so physicians of the old school commonly saw in the phenomena of mental abnormality the effects of organic disease, in themselves wholly

without causal influence. Hence it sufficed to know just so much about the mind as to be able to recognize abnormal symptoms. Beyond this, serious study of psychology was unnecessary, though it might be interesting.

But if I read aright the signs of our time, a change has come over the scene. It is now pretty widely held that abnormal mental symptoms are not *only* indications of abnormal physiological processes (though this they may also be), but are due to underlying psychical causes. Their origin must be sought not only in the nervous system—or, if sought there only, will not be found—but in the psychical system, which either subtly interacts with the brain or is correlated with its functional processes. In either case mental effects as such must be traced to causes which are themselves psychical in their nature. And if this be so—if he whose health and sanity is to be preserved is not only a physical but a psychical being—may one not urge that the time has come for a consideration of the question whether opportunity should not be given, not only to learn from a physiologist the best that is known about the one, but also from a psychologist the best that is known about the other?

If one seeks to deal with practical issues in a practical way, one must look around with circumspection. One then asks whether in current practice there are not lines of treatment, by suggestion and as the outcome of psycho-analysis, which are becoming generally recognized as something far better than mere quackery: whether there is not thus implied a submerged part of the psychical system (in intimate touch, perhaps, with the physiological system) beneath the threshold of our ordinary consciousness: whether there is not a mental as well as a biological embryology: whether psychical phylogenesis may not throw light upon ontogenesis in the human individual; and whether the psychologist may not have something of practical value to teach in this matter.

One has here, of course, in view the working hypothesis of the unconscious. Now this word is negative in form, and, one would suppose, should, in the first instance, imply a prior definition of the consciousness which it is *not*. And I take it that one must turn to the psychologist to supply such a preliminary definition. One would then get: (1) Consciousness, as the class of all instances of being conscious, with certain assignable characteristics; and (2) The unconscious, as comprising psychical processes which lack these characteristics. The assigning of positive characteristics to the unconscious would then follow in due course. If there be two such classes, it is surely the psychologist who must define them. One is told, however, that academic psychology cannot supply the kind of definitions which are of service for the purpose in hand, or at any rate

has so far failed to do so; for this purpose a new psychology is needed to replace the old. One may perhaps harbour doubts as to whether the old psychology to be discarded is not in large measure obsolete psychology, much of which has been already superseded in the modern development of the science. But let that pass. The essential point, presumably, is that what is needed by those who deal with such matters in the practice of their profession is a *true* psychology, whether it be old or new. If so, is it unreasonable to submit that this should be officially taught by those who (1) have made a special study of this department of scientific knowledge, and (2) know, and can show, at least in broad outline, how it may be applied in professional life?

Nay, it may be said, what is wanted is a specialist to lecture to specialists; and a good deal of such teaching is already provided. One must not split hairs: but the word 'specialist' is a little ambiguous. What I am myself urging is that the subject should be entrusted to a specialist, or, in other words, to a psychologist. But there are specialists in application, e.g., in the methods of psycho-analysis. And one may at least raise the question whether it is wise to entrust the subject entirely to them. Just as there is one science of chemistry, which may be applied to metallurgy, or to brewing, or to soap-boiling, and the fundamental principles of this science should be taught by a chemist, so also there should be one science of psychology, which may be applied in teaching, in advertising, or in psycho-analysis, and the fundamental principles of this science should be taught by a psychologist. This does not preclude further specialization in application by those who have learnt to apply general principles in particular ways. It marks only a claim that those who thus apply them should themselves have a sound and adequate training in chemistry or in psychology. One would not regard as satisfactory the teaching of one kind of physiology to science students and another kind to medical students at any stage of their career; nor would one regard it as satisfactory that one kind of psychology should be taught to these and another kind to those. Of which, as matters now stand, there is, I think, some danger.

If, however, it be granted, just for the sake of argument, that something may be adduced on the lines briefly indicated in favour of the contention that the teacher of psychology, however applied, should be a psychologist, it may still be said that those who need to learn are those only who are to become specialists in application. That may be so. I must leave the profession to judge. But one is certainly often told that if those who came forward so nobly in the late war had been better able to trace to their psychical causes certain mental symptoms, much suffering would have been averted and many men would have been more speedily restored to mental and bodily health.

So far as it goes, this is in favour of psychology for all. Furthermore, if once it be realized that in each one of us there is a psychical system with deep-laid foundations influencing our whole life in a hidden way—that there are psycho-physical dispositions and processes which are only manifest in the supraliminal mental life through their emergent effects—is it not then a tenable position that every practitioner should have some knowledge of that science which deals with the functional activity of this psychical system?

No doubt it may be said that my attitude is like unto that of the shoemaker who extols the virtue of leather as affording the best foothold in all walks of life. But I am trying to look a little beyond my last; and I may as well give a sketch of what I think I see.

I ask myself what a man walks about with under his hat. What is he? For he it is with whom the medical practitioner has to deal. Well, he is (1) a marvellously complex physico-chemical system; he is (2) an organism; he is also (3) an animal, with certain fundamental instincts; and he is (4) a man, with sundry human interests. But as organism he is something more than a physico-chemical system; as animal he is something more than an organism; as man he is something more than an animal. Still he is all of these; all at once; and all in delicate interrelations. Now it is generally recognized that the medical student should know something about physico-chemical systems—not only this one under the man's hat, but more widely and generally. He needs therefore an adequate grounding in chemistry and physics. He should, too, learn the nature of organisms, their structure, the functional processes wherein they live, their mode of development, and so forth; this broadly and generally, by instituting sufficiently wide comparisons; this also in full detail in the particular organism which is his 'subject'. So far one is merely giving inadequate expression to the commonplace. Take, however, the next step. Under the same hat is an animal with certain fundamental instincts. Is much opportunity afforded to the medical student for acquiring systematic knowledge of these deep-seated instincts in animal life? I shall be told that he really has not the time for this. I suppose this must be because those who draw up the curriculum deem the matter unimportant. But is this quite up to date? No doubt a quarter of a century ago those who made a special study of instinct were regarded as amiable wanderers in amusing side-tracks of natural history. Is that so to-day? Are we not coming to realize more and more fully that on instinctive foundations our life is largely built, and that our human interests are partly enriched and partly tainted from this deep-lying source? But both these interests and the instincts on which they are founded fall for consideration by the psychologist. Is it, then, wholly unreasonable to plead that the medical student



should learn from a trained psychologist, at least in essential outline, what goes on in the psychical system, which, no less than the organic system and the physico-chemical system, makes us what we are in health and in disease?

Now here I must pause to say, parenthetically, that part of the revolt, in certain quarters, from 'academic psychology' is based upon the supposition that it deals only or chiefly with the intellectual powers, with the higher emotions and sentiments, with volition as it bears fruit in the thought and conduct of philosophers. That may have been so in the past. It is so no longer. With the coming of the evolutionary concept came also genetic psychology. It is not true that modern psychology deals only or even chiefly with the most cultivated flowers and fruits of the psychical system implanted in us; it deals also with the stem and the roots which are embedded in the organism. In the Arts classroom the psychologist might well devote most of his time to the flowers and the fruitage; in the science laboratory he would deal with the growing stem by experimental methods; in the medical school he would be mainly concerned with the roots from which the whole plant has grown. And if we can afford a separate lecturer for the medical school, let him be first and foremost a psychologist, and secondly one who has specialized on genetic problems.

He would probably choose the biological avenue of approach to these problems. Let me try to summarize, very briefly, the kind of line he might take in leading up to the instincts of animal life. He might begin with a reminder on differentiation and integration, not as mere words, but as vitalizing concepts. If we consider, he might say, the life of a complex organism, we find a number of so-called systems, or more strictly sub-systems, within the individual life-system as a whole—respiratory, circulatory, reproductive, and so on. We find these functional activities interrelated in many ways in the life that is common to them all. We consider the integrative action of the nervous system, and of that which may be called the hormonal system of internal secretions so subtly distributed by the bloodstream. He would remind his hearers how the working of any one sub-system may facilitate or enhance the working of another, or may partially arrest it, or inhibit it. Abnormal functional activity of one system may throw another system out of gear; and so the trouble may spread. But, he would probably insist, the sub-systems are not historically prior to the system as a whole within which they are functional factors; nor is the whole prior to its constituent parts: whole and parts have been progressively evolved together with closely related interplay.

Now what holds good, he might continue, for the life-system, is

true also in principle, *mutatis mutandis*, of the psychical system. Connected in some way with the upper brain, it is an *imperium in imperio*, in some measure consciously, but in larger measure unconsciously, in touch with much, if not all, that goes on in the wider empire. But the conscious outlook of the mind has reference to the environment, and even the inner happenings of the psychical system as a whole acquire 'meaning' in terms of this external reference. Hence in the psychical life, as contrasted with that which we distinguish as organic, there is a regrouping in reference to the objects of which we are conscious in perception. And hence we say that dispositions, or instincts, or innate tendencies, or interests, or emotional systems, are awakened to activity from a state of more or less structural slumber (we are sure to use some more or less metaphorical expressions). These are then regarded as the sub-systems of the animal mind: each has some measure of autonomous integration: all are interrelated: and in a well-balanced psychical system the net results of a bewildering number of processes, conscious and unconscious, are caught up in all-embracing integration. This is the psychical life as a whole. But taken in detail, there is much interplay between the psychical sub-systems, with facilitation, partial arrest, more or less complete inhibition, and perhaps derangement. There may be failure of normal integration, or even such dislocation as we speak of as dissociation. And any of the sub-systems—the so-called sex-complex, for example—may be active in the subliminal region of the unconscious, or may emerge into the supraliminal field.

There is thus integration within the sub-systems severally and integration of these sub-systems collectively, so as to constitute a whole with due balance and poise. The unity of the whole is not that of simplicity, but that of integrated complexity. In the degree in which the total integration fails to conduce to what we describe as mental health and sanity, we speak of the poise as abnormal, and seek by appropriate means (1) to ascertain to what cause the lack of balance is due, and (2) to re-establish, so far as possible, the normal poise. The difficulty is that part, nay much, of the working of each sub-system is in the subliminal region of the unconscious, and is known in the supraliminal field of the person concerned only by its normal or abnormal effects. The aim of psycho-analysis in practice is to ascertain the nature of, and if possible the measure of, this unconscious determinant of mental processes above the threshold.

Of course the lecturer I have in view would do much better than this. But this is the kind of line he might take, and thus lead up to practical application. And here I must leave him: for I would not implicate even an imaginary person with such heresy as I may now indulge in, mainly with a view to the plea that the problems raised should be discussed by an all-round psychologist.

In psycho-analysis there are two closely interwoven strands—that of practice and that of theory. The first we must welcome for all it is worth: and beyond question it is worth much. The second must be discussed as critically as any other systematic body of hypotheses in psychology. Here the trouble is that one has to grapple with new technical terms, some of them founded on metaphor and mythology, and with old terms used in quite unfamiliar ways. Much of the practical work deals with cases in which the normal poise has been in some way upset, but I take it that the theory applies to all cases. I can only deal, in the most summary fashion, with the theory in its Freudian form, as presented, for example, in Dr. Ernest Jones' *Papers on Psycho-analysis*.

It seems that within each one of us two psychical systems are differentiated, between which a barrier is established. There is: (1) That of the conscious censor: and (2) That of the unconscious (including here the preconscious). The latter forms an infantile core "which has persisted *in an unaltered form* [italics mine] as if it had been imbedded in the centre of all later activity". Each has its 'wishes' and 'thoughts': but the censor is unaware of those which are active in the unconscious. Although unaware of them, it resents their intrusion and represses them—in some cases, it seems, before, through actual intrusion, it can be aware of them. The unconscious has its own affective enjoyment—infantile, alogical, and non-moral: for "it may be stated as a general law that what in the unconscious has a positive affective tone, i.e., of pleasure, has in consciousness a negative affective tone, i.e., of displeasure". If there is failure, on the part of the censor, in repression, what is perforce admitted to consciousness is not only thus affectively "served with a negative prefix", but is 'sublimated' and is disguised in symbolism which is not repugnant to the censor. This is best exemplified in dreams, which in their 'latent' and unconscious source are predominantly sexual in a wide and rather indefinite sense that is apt to become unpleasantly definite under psycho-analytic interpretation. To put the matter plainly, most dreams, thus interpreted, seem to reek of phallicism. And since it is difficult to find *anything* which has *not* been at some time and somewhere a phallic symbol, no matter what the 'manifest' dream may be—the dream that passes the barrier and is remembered—it is thus almost inevitably tainted at its infantile and unconscious source. For it looks as if the unconscious is supposed to retain memory-images of what bulked large in the consciousness of all sorts of primitive folk.

Now one must not reject facts which one may regard, censoriously, as exceedingly unpleasant. But one may ask whether what are reported as facts are not falsely conceptualized in the light of a theory the

validity of which is open to question. That I believe to be the case. But such a lecturer on psychology as I have in view would fully discuss other theories of dreams, and critically compare them with that of Freud. He would have also to discuss the psychological status of ideas and of memory-images. He would have perhaps to consider, and compare with M. Bergson's very different treatment, a view which I will put in a frankly dogmatic form, since it goes to the root of the matter. There are, I should contend, unconscious psychical *processes* which in large measure (and perhaps especially in dreams) serve to determine the nature and course of conscious ideas; but there are, in the unconscious, no ideas, no re-presentations, no memory-images, such as are developed in consciousness and there only. The lecturer (when he is appointed) will know exactly what I mean, and will submit such views to searching criticism. But what do I mean? Baldly stated, in terms of an analogy, I mean that ideas or memory-images are no more preserved, as such, in the mind, than sounds, as such, are preserved in the gramophone record. Only the conditions of reproduction are preserved. If I may so put it, ideas (thoughts, too, and wishes, in the traditional sense of these words) only exist as such when they are consciously cognized. At other times they do not exist as ideas. The word 'revival' is unfortunate and misleading. It implies that memory-images slumber, to be awakened under 'the laws of association'. That I believe to be sheer mythology which we are now outgrowing. M. Bergson tirelessly throws ridicule on the notion that ideas can be stored in the brain. One wonders who nowadays entertains this notion. But he believes that they are stored in the mind as memory. Well, are they? It is for the psychologist to discuss the arguments for and against this hypothesis. His business it is, with all the data before him, to formulate theory. And I take it that practice should be based on sound theory. Hence there is an obvious bearing of all this on Freudian psycho-analysis. If I am right, there are no phallic ideas in the unconscious. We may cleanse these Augean stables. The latent dream is a bit of sheer mythology. It is a metaphorical interpretation of an instinctive urge or 'hormic,' which is something wholly different from a 'wish' or a 'thought'. And whether these words should be re-defined in psychology after Freudian fashion is just one of those questions which it is for the psychologist to discuss on broad grounds.

It must not be supposed that I attach little value to the outcome of the work that has been done in psycho-analysis. That is not so. There is much that no psychologist can afford to neglect, much that will modify and enrich existing modes of interpretation. We cannot but welcome new sources of data; and we must not lightly set aside new theory, certain features of which, after due criticism, may be



incorporated with old generalizations, so that the complex integration which obtains within the whole psychical system may be better understood.

As in the discussion of life-problems, so too in that of mind-problems, the stress in ultimate interpretation is on integration. It is now realized that, within the psychical system, only a small part of the integration which obtains, though no doubt a very important part, is established in the light of our personal consciousness, thereafter to descend towards the unconscious in habit. Far more integration (however it was originally established) is ours through inheritance. This affords the unconscious foundation of our mental life. But it need not remain subliminal: it may surge up above the threshold with enjoyment which is in itself new in the supraliminal region of that person, though it is swiftly integrated with much that is old. It brings with it no ideas or memory-images, though it colours affectively our mental outlook towards presentations old and new.

In the organism there is differentiation of function: but the life of the organism is the integration of all functions. In the higher animals there is differentiation of instinct: but the psychical life of the animal is the integration of instincts, supplemented by intelligent guidance. At certain times, however, one of these instincts, notably the reproductive instinct, may so dominate the psychical life that others are temporarily suppressed. The whole poise of the psychical system is then altered. In man, there are also in due course developed, in the supraliminal consciousness, distinctively human 'interests'. Now one and now another of these 'interests' may be dominant, with relative suppression of others, which may become subliminal, and with subtle alterations of mental poise. Furthermore, the whole system of such human 'interests' may be more or less markedly differentiated from that more directly founded on the instincts of animal life. Not only this: the human 'interests' may be further differentiated into those that are socially approved and those which are not. But, save in abnormal cases of 'dissociation', differentiation is balanced by concomitant integration. There is: (1) That which subserves organic life: (2) That which furthers animal behaviour (including reproduction): (3) That which leads to the development of human 'interests': and (4) That which accords with the 'social conscience'. Where the last-named is dominant, we have much that is picturesque, and I think in the main correctly, described in terms of the censor. But all these are unconsciously or consciously inter-related in such wise that some measure of total integration is partly retained and partly established in each one of us, with subtle and sometimes swift variations in dominance, with facilitation or arrest of this or that, and sometimes with temporary or permanent throwing



of this or that out of gear. In which of us is integration, conscious and unconscious, all that the heart could desire?

I have written in response to editorial request. Otherwise I should not have dared to intrude where perhaps I am not much wanted. And I feel that it may quite well be said that I am so ignorant of the practical politics of medical training that I am incapable of making suggestions of any worth.

What does it come to? This: that man is not only a complex physiological system, but an equally complex psychical system—conscious, but with unconscious foundations; that the medical practitioner has to deal with the man as a whole; that in current practice some knowledge of psychology is of real value; that in specialized practice it is essential; and that the time has come to consider whether the psychologist should not have a status on the staff of a medical school analogous to that of the physiologist.

If there be nothing in the suggestion, there's an end of the matter. But if perchance there is something in it, then the questions arise: For all or for some? How much in either case? At what period of study? And by whom?

These questions would need further discussion by those who are fully competent to deal with them. I am not thus competent. But I incline to the opinion, for what it may be worth, that some adequate instruction should be given to all medical students, not too early, say after they have been well grounded in physiology; and that more should be given to specialists towards the close of their curriculum, or in a post-graduate course. How much in either case I must leave others to judge. It is a difficult question where art is long and student life is short. The shoemaker is likely to insist too much on the importance of leather.

To the question, By whom? I unhesitatingly reply: By a psychologist. But then there are psychologists and psychologists. Well, then, by a psychologist who has been trained not only in a school of philosophy but also in a school of biology. He must not be out of touch with his colleague the physiologist. He must know not only about the emotions but about internal secretions. And he must have adequate acquaintance with the manner in which what he teaches shall be applied in the practice of the profession. If he himself be a member of the profession, so much the better: but he must be a psychologist.

## EPIDEMIC ENCEPHALITIS: CLINICAL PAPERS BY VARIOUS AUTHORS.

### I.—INTRODUCTION.

BY SIR THOMAS HORDER, LONDON.

It is only when a disease has been popularized, as it were, by the frequent description of individual cases, and by the emphasis laid upon features that are specially common, that its concept enters into the mind of the pre-occupied practitioner and the clinical picture becomes a thing which he looks for.

This principle is specially true of every disease that has existed first in sporadic form, then in epidemics, and then in sporadic form again. It was so—to speak only of the experience of recent decades—in the case of influenza, and in the case of cerebrospinal fever. Many of the early sporadic cases of both these diseases were entirely misunderstood, there being no criterion by which to judge them. Then came epidemics which set a comparatively easy standard for diagnosis, and this standard has been so frequently seen and described that the sporadic cases of the post-epidemic phase are tracked down without difficulty.

It is so with encephalitis. But since many fewer doctors had opportunities of observing cases of encephalitis during the epidemic stage, and since the total number of cases occurring has been much smaller than in the other two diseases just referred to, it follows that there are many practitioners still without a personal acquaintance with the clinical entity, and there is a much less well-defined composite photograph available for their guidance.

It therefore becomes a matter of prime importance that clinicians should marshal their experiences, and set down their observations, with as much care and exactness as possible, and this whilst questions of exact pathology await the results of laboratory research.

The short symposium of papers, to which these few remarks are introductory, forms a valuable contribution on these lines from Bristol clinicians. The papers show clearly that these observers have made good use of the opportunities afforded them in the material available in the West of England. Most of the cases described are of the lethargic group, and the central point of interest in them as a group is the

marked dominance of mental symptoms observed. Dr. George Parker, in particular, comments in general terms upon the frequency and the wide range of these mental effects as seen in this type of encephalitis—and, it might be added, in other types also, though it is in the lethargic type that these manifestations attain such dimensions as to risk confusion with hysteria and with the primary psychoses. Dr. Neild's cases also revealed marked hysteroid features.

Perusal of cases such as these, and of others like them, must needs bring to the honest clinician's mind the recollection of some of his obscure cases in the past, in which hysteria, or some form of psychosis, was the best diagnosis he could advance in explanation of the picture before him: just as perusals of cases of encephalitis of the ophthalmoparetic and encephalomyelitic types, especially if they be subchronic in course, must needs make the clinician remember his erstwhile inadequate suggestions of myasthenia and cerebral thrombosis. And who amongst us to-day, with his experience of the meningeal type of this protean disease, does not plead guilty to having maintained too stoutly in the past—of some surprisingly negative lumbar-puncture finding—that the case was nevertheless one of cerebrospinal fever?

Up to the present time most of the research work undertaken to decide this point favours the view that the viruses of poliomyelitis and of encephalitis lethargica are distinct. And the absence of any reference to polar effects in the Bristol cases gives clinical corroboration of this view. If, as Loewe and Strauss maintain, rabbits are susceptible to the virus of poliomyelitis but not to that of encephalitis, whereas monkeys show the converse susceptibility: and if other workers confirm their finding that the cerebrospinal fluid of poliomyelitis is innocuous to both these animals, whilst the cerebrospinal fluid of epidemic encephalitis produces typical lesions in both: then we have gone a long way towards settling this very moot point. In practice, however, the matter would seem to be by no means so simple as this, seeing that polar emergencies are not very uncommon in cases which present marked signs of cerebral involvement, including lethargy. No doubt this is more often so in sporadic than in epidemic cases. The conception of what is possible to the poliomyelitis virus in respect of vascular cerebral infiltration has probably been underestimated on the one hand, and the search for polar changes in the course of cases of encephalitis has probably been too casual on the other. It is evidently a point of great importance to record exactly *at what stage* in the course of any case these polar effects are first manifested. All of which bears out the significance of Dr. Carey Coombs's insistence on the desirability of recording carefully individual cases as and when they offer themselves for observation. In this way the necessary

collateral work of clinical medicine and research will eventually lead to a clear issue and definite knowledge in regard to these important and interesting disease-processes.

## II.—MENTAL EFFECTS OF ENCEPHALITIS LETHARGICA.

By GEORGE PARKER, BRISTOL.

MacNalty states that "in every case of encephalitis which has been studied in detail the note 'a strong functional element present' is recorded in the case-book"; and although other observers have not corroborated this rather extreme view, some such symptoms may be expected in a proportion of cases, since the lesions are in the region of the basal ganglia and optic thalamus where the afferent stimuli from the environment stream in. Thus the very frequent combination of stupor with ophthalmoplegia or facial paralysis points clinically to the situation of the most common lesions, and this is confirmed by many post-mortem findings.

In confirmation of this view, we note that in the prodromal stage before lethargy comes on, patients often show stupidity, loss of brightness and intelligence, and inaccuracy in their work, or on the other hand we may see them laughing or weeping without cause. Later on, stupor from the cutting off of the stimuli from the environment is combined with delirium from cerebration uncontrolled by the perceptions and judgements which those stimuli would give rise to. As the lethargy in course of time decreases, the mental changes become still more obvious, and may continue for some time longer. Thus, in every stage of the disease 'hysterical' and emotional symptoms and mental weakness may be prominent, and, when localizing signs are absent or transient, they may give rise to a wrong diagnosis, and lead to cases being missed altogether. Hence the importance of looking out for them as possible symptoms of an attack of the disease.

Another question crops up, whether permanent mental effects may be expected, and this is not easy to answer. The actual paralysis clear up more or less quickly, but the listlessness, dullness, or nervous condition may last an indefinite period. Whether this is confined to the period of convalescence, or whether emotional or mental feebleness may be lifelong, is important but as yet uncertain.

The three following cases show more or less mental changes after seven months; neither patient is really well, but the great improvement which has taken place has been perhaps as rapid as could be expected.

*Case 1.*—R. W., 16, a tobacco worker, was attacked on Dec. 21, 1919, with severe headache, drowsiness, and constipation. She was admitted

to the Bristol General Hospital on Dec. 30 with profound lethargy and occasional delirium, lying curled up on one side, the head slightly retracted, mouth open, the eyes closed, and the pupils contracted and showing but slight reaction to light. Pyrexia for ten days was recorded. Though so extremely drowsy, she resisted the removal of her clothes, and could even be made to answer questions if spoken to firmly and plainly. There was at times incontinence of urine and even faeces. When lumbar puncture was performed, the fluid was found to be under slightly increased pressure and showed a slight lymphocytosis. Rather later than this, left facial paralysis came on, and ptosis of the left eyelid. The plantar reflexes in both feet were flexor, and the knee-jerks were hardly perceptible. Kernig's sign was not present.

For some ten weeks or more she remained lying in bed or (when compelled) sitting in a chair, sleeping with her mouth open and the saliva dribbling down. From her mask-like face, gaping mouth, and dirty habits, she looked like an imbecile child. She was taught to repeat childish verses in a slow muttering voice; she could walk well when compelled, but if possible steered for the nearest chair, where she would at once curl up and fall asleep. Her general health remained good. Dirty and indolent as she was, she eventually by slow degrees began to sew and read and write, and gradually improved in her behaviour. At last, after three months and a half, she had so far recovered that she was sent to a convalescent home at the seaside, and wrote me a well-expressed little note of thanks on her departure.

By August, 1920, she had returned to work and was clean, bright, and cheerful, but it was doubtful whether she had quite regained her mental balance. The sister noticed that in talking she was still apt to run on with an inaudible voice for some sentences, and seemed rather "flighty."

*Case 2.* M. W., 17, a tobacco worker, admitted Dec. 17, 1919, for drowsiness. Seven years previously she had been ill with chorea. Father asthmatic. The drowsiness began fourteen days previously, followed by diplopia and pain "near one ankle". Temperature  $100^{\circ}$ ; neck stiff. On Dec. 20 the lethargy was marked, and her face was mask-like. There was nystagmus, a nasal voice, and the deep reflexes were sluggish. Flexibilitas cerea was noticed in left arm.

On Dec. 23 the spinal fluid was found quite normal and under slight pressure. There was definite facial paresis on both sides. On Dec. 27 rhythmic spasmodic contractions of the left arm and leg had developed. The patient remained sleeping and speechless, but took food fairly. The arm remained in any position given to it for a time.

On Jan. 5, 1920, being roughly ordered to get up, the patient, who had lain apparently quite helpless for a fortnight, got up and walked round the bed, but fell in a heap when trying to get back. About this time the silent lethargic state was varied by loud shouting. On Jan. 6, she suddenly threw her dinner across the ward, and after she had got out of bed threw herself quite naked across it. She was then placed in a private ward, where she lay with closed eyes. The spasmodic rhythmic movements of the left arm continued. She remained in this state for a fortnight. One day, being left alone, she slipped out and was found walking about the public corridors absolutely naked. On a second occasion she went to the sister's room in the same state, and took away what she liked. Her habits were filthy; urine and faeces were passed anywhere. On Jan. 21 she was taken home at the mother's request.



In March she was seen at home, and had improved, but could not speak normally. On July 24 she had recovered, except for the rhythmic spasm of the left arm and leg, which took place twenty-four times to the minute. She could walk a short distance, and took her share in the housework in spite of the spasms. She talked well, had gained greatly in weight, and had lost her tendency to cry out or shout. Her mother reported that she showed no loss of mental power, and could go errands and add up a bill correctly. She was neatly dressed, and seemed fairly normal in her behaviour during the interview.

*(Case 3.—D. L., 26, married, was attacked with difficulty of vision (diplopia) on Jan. 2, 1920, when apparently in perfect health: pyrexia, slight stiffness in back of neck, some vomiting, and giddiness followed. Lethargy, with occasional delirium at night, was marked. The temperature rose to 100–102° for about a fortnight. Fibrillary movements in face and limbs, and some rigidity and stiffness, were followed by double facial paralysis and constant and rapid nystagmus of both eyes. Ptosis of the left eyelid, but no strabismus, was noted. The nystagmus was continuous, but increased by exertion, and so bad was it that months later she could only read by holding a card below the line she was looking at. This lasted quite seven months. It was practically impossible to get a view of the fundus oculi. No Babinski's sign, increase of knee-jerks, or Kernig's sign was present. She slept continuously for many weeks, but could be roused for a minute or two. Asthenia or stiffness of the limbs prevented her getting up, except when delirious, but she soon regained power in her hands to feed herself. The appetite and general health remained good. Menstruation ceased for several months, but then returned normally. She spoke rationally when roused, but showed little anxiety or interest in her surroundings.*

After three months she began to walk about her room with help, but evinced nervousness and fear, and complained of giddiness. In July she could walk out-of-doors, even alone, but was still timid and nervous, though drowsy. I was struck with her disinclination to trouble about her house or husband, who had recently started in business, and on whom her illness was a terrible strain. By the beginning of August the nystagmus had nearly gone. She had gained a good deal in weight, and was mentally more normal, though still timid and rather irritable, and disliked being left alone. She now showed some wish to take part in the business, but was not able to do much. Her husband noticed that she had developed a curious craving for brilliant colours in dress, which was in marked contrast to her previous choice, and was striking though in good taste.

In these three patients, besides the pyrexia, facial paralyse, intense drowsiness, and more or less pronounced inability to move the limbs in the early stages, we find an important group of mental symptoms, varying from delirium, catalepsy, and immodest and dirty behaviour, to simple loss of interest in surroundings, nervous fears, timidity, and a certain childishness. In the worst cases it was soon clear, even if physical signs had been absent, that we were not dealing with merely functional conditions: nor were the nervous symptoms confined to the patient with the choreic history. All showed a

childish mentality and little appreciation of or worry about their state. Still, their progress has been so steady that there seems some reason to hope that they will eventually regain their previous mental level.

### III.—NOTES ON ENCEPHALITIS LETHARGICA.

By J. ODERY SYMES, BRISTOL.

Six cases of encephalitis lethargica were admitted to the Bristol General Hospital under my care between June and September, 1920. Three of these died: a woman, age 45, ten days from the onset; a man, age 24, two weeks from the onset; and a boy, age 14, three weeks from the onset. Of the cases that recovered, one, a woman of 32, was under treatment for four weeks; a man of 49 was an in-patient for fourteen weeks; and a boy of 12 remained in hospital for four weeks. Other doubtful cases were seen in which the symptoms were not sufficiently definite to permit of a positive diagnosis. The following synopsis of the symptoms found in the present series of cases may be found of interest.

*Prodromal.*—Pains in head (5 cases), diplopia (3 cases), tremors (3 cases), giddiness (2 cases), vomiting (1 case), drowsiness (5 cases).

*General.*—Lethargy and prolonged sleeping (6 cases), mask-like expression (4 cases), delirium (2 cases), twitching, tremors, or choreiform movements (3 cases), great prostration (3 cases).

Examination of the cranial nerves showed the optic discs to be normal in every case; 3 cases showed ptosis, but in all the pupils were normal and external ocular muscles intact. A voluntary contraction of the lids in these cases sometimes makes it difficult to recognize the ptosis. In 1 case there was loss of the sense of taste; bilateral facial paralysis, 1 case; one-sided facial paralysis, 1 case; impairment of hearing, 2 cases; difficulty in swallowing, 1 case; tremor of tongue, 1 case; shallow respirations, 3 cases.

There was slight motor paresis and inco-ordination of the limbs on one side in 1 case. In all cases the deep reflexes were normal; 3 cases had incontinence of urine and faeces; 2 cases showed glossiness of the skin of the face. No abnormality of the cerebrospinal fluid was detected. A faint trace of albumin was present in the urine of 3 cases. The blood-pressure was low, but in one case the systolic pressure was 160 mm. The number of red cells was normal, and in only one case was there leucocytosis (16,000). In the 3 cases that recovered the temperature was low, never exceeding 100°. In the fatal cases the evening temperature was about 103°, and it was noted that the pulse-rate was unduly rapid in proportion to the fever. Constipation was the rule. Wassermann reactions were negative in all cases.

There was a possibility of infection in two of the patients who lived in the same street immediately opposite to one another. In two cases of encephalitis under my care in 1919, a father and a daughter, the date of contact could be accurately fixed, and the incubation period was from three to seven days.\*

The final state of such cases as recover is varied. Some apparently return speedily to a normal condition of body and mind. A man included in the present series of cases is now, after four months' illness, still suffering from some weakness of the left arm and leg, general tremor, difficulty in swallowing, and left-sided ptosis. A patient recently reported himself at the hospital eighteen months after the original attack, and he presents a typical picture of early paralysis agitans. He is able, however, to control the tremor and to follow his occupation of an aeroplane worker.

#### IV.—AN IMPRESSION OF ENCEPHALITIS LETHARGICA.

By NEWMAN NEILD, BRISTOL.

These notes must be regarded as impressions derived from the most outstanding features in some eight or nine cases whose ages varied from about eighteen months to sixty years. The two cases at the extremes of age both died, the youngest after an illness of under fourteen days. The latter case was sent to me by Dr. James Wallace with the diagnosis of encephalitis lethargica. The onset appears to have been rapid, and was a miniature of the most typical form of the disease: great lethargy and very slight squint. The infant made no protest when it was moved, lay passively in almost any position in which it was placed, and there were no signs of meningeal irritation, such as those seen in tuberculous or post-bacillary meningitis, unless the squint should be considered as being so. There was no difficulty about the feeds of milk until the last two days before death. There had been no stiffness of the neck, and throughout the features were pale and expressionless.

The patient about 60 years old had already been ill for some three weeks before I was asked to see him, but he was still getting about the house, although with great difficulty. Latterly he had to be helped to dress and often to be fed, for he would stop and dream whilst he held his spoon arrested half-way up to his mouth in a somewhat cataleptic way. The most striking feature in his case was the position of his head, his chin resting on his chest as if there were some paralysis. But if the head was slowly raised—slowly because of the muscular resistance—it only sank back to its former position. He

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\* *Bristol Medico-Chirurgical Journal*, 1920, 25.

was taken into the Bristol General Hospital, where his case became quite typical, but, becoming progressively weaker, he died after a month or so.

A third fatal case, a man about 40, lasted only some ten days; a more sthenic case than any other that I have had. He had a high temperature and was very flushed when I saw him first, but the most striking feature about this case was the 'hysterical' character of some of his performances. Unless spoken to, fed, or otherwise disturbed, he was completely lethargic, and his facial expression mask-like. He also showed that peculiar disinclination to move the eyes aside from the straight-ahead unseeing gaze through half-opened eyelids. In several places on either side, his body showed scratches due to attacks of coarse, rhythmic movements at the elbow of an otherwise rigid arm. The rate of movement was about that of paralysis agitans, but whilst the movements appeared to be beyond his control, the application of the movement to scratching suggested intention. If his body was moved and the arm placed in a position by which scratching was avoided, the limb soon returned to the attack on the same spot. Yet it was not difficult to distract his attention, whereupon the movements ceased. If he was lying on his back or side, and the pillows were removed from under his head, the head remained held at the same height above the mattress as if the pillows were still there. When his hand was taken to help him out of bed, he gripped my hand firmly with stiff fingers, but avoided making any effective use of it: *much try and little pull*, a most valuable sign which has frequently revealed to me the hysterical factor in a patient's condition. He was taken into the hospital, and died within twenty-four hours of admission.

The case just described was the only one in which such signs were observed during the increase of the disease. Three others, all women, showed distinct 'hysterical' signs during the wane: some intentional movements were performed in a somewhat choreic manner, and at the same time the patients were emotional.

A colleague of mine very kindly showed me a case where the choreiform movements were so continuous and severe that the patient's hands were padded and boards fixed at either side of the bed. The required mental surprise was given by suddenly jerking the bedclothes from her; she instantly ceased the movements, and got out over the foot of the bed when ordered to do so. She was next told to help me remove the boards; but, unfortunately, she was allowed to realize that I had forgotten the wool and bandages upon her hands, and the 'cure' was promptly interrupted. She glanced helplessly at her bandages for the fraction of a second, and then tried to collapse between the head of the bed and the wall, giving just that



hint of having selected both the method of falling and the spot on which to fall which is so revealing in 'hysteria'.

One of the cases, a girl about 19 or so, had rather jerky movements of the right arm during recovery, and it was found later that she was unable to write more than a word or two at one sitting, and those hardly legible, although the jerkiness had disappeared. Concentration of her thoughts and attempts at writing very soon tired her, although she had been walking about the ward for some time. The tendon reactions on the right side were rather more exaggerated than on the left, but the differences were so slight that at times the observer suspected his own expectancy to be responsible for the findings: the plantar reflex was doubtful, but generally extensor. For a few weeks any object pressed into the palm of the right hand felt hot, although she was able to distinguish heat from cold when tested in the ordinary way. Before leaving hospital this symptom had disappeared, as well as a complete astereognosis she had had in this hand. Her walking lacked the appearance of confidence, and although both legs were at fault the right was rather the worse. A few months after she returned home she wrote a letter in quite a good hand.

Had I not seen the case just mentioned, it is very probable that I should have failed to recognize a case sent to me from Wiltshire a few months later. The patient had already been seen at various times by seven medical men who were unanimously in favour of a diagnosis of hysteria. Three of these had seen her during the active period of the disease eighteen months before, and their diagnosis goes at least to support the observation that some of these cases are associated with signs which taken by themselves are indistinguishable from 'hysteria'. But the expression of the eyes in this case was that which I have learnt to associate with those who have had an attack of encephalitis epidemica. Without an example before one it is difficult to make an exact analysis of that which constitutes this expression. There is an entire absence of the normal rapid but very minute movement of the eyes when the patient looks one in the face, and there is no 'brilliance of expression'. There is a slight delay in starting to move, and this delay is also noticeable in some cases in the gait and in the mental processes. It is not precisely the word that I want, but in gait, in movement of the eyes, and in mental response there seems to be a kind of initial 'numbness'. In her case the left side was the more affected one; hence the slight disturbances were not so noticeable. The left eyelid space was the wider, and whilst speaking the lips were more drawn apart on the right side. On the left side the tendon reflexes were a little increased and the plantar response was extensor. The abdominal reflexes were at first equal, but after



testing the four quadrants rapidly many times the left side very obviously tired down to a faint response; but this recovered after a moment or two of rest.

Another case, that of a woman of 30, seems worth mentioning, in that she went to the doctor first complaining of a fullness in the head when she stooped to lace her boots or to hold the baby out, and it was not until three weeks after her first visit to him that she returned complaining of double vision.

## V.—‘EPIDEMIC’ ENCEPHALITIS.

BY CAREY COOMBS, BRISTOL.

The wave of brain infection of anomalous type that succeeded the war should be regarded in the light of something more than a mere nosological curiosity. It is true that the number of cases is small, but those who are attacked are either killed or seriously injured by the infection.

Three cases, not among the ten alluded to below, will illustrate this point. One, a child of 4, was brought by her mother to my out-patient department at the Bristol General Hospital one day because of her obviously abnormal behaviour. She fought continually with her mother, talked at the top of her voice, and generally showed an absolute lack of restraint. This, the mother said, dated from a short illness some weeks previously, in which the child was feverish, very sleepy, and ‘cross-eyed’. I asked the medical man who saw her during this illness what his view of the case was, and found he had not at the time thought of encephalitis lethargica, though in retrospect he agreed with me that it was almost certainly a case of this kind. Since I first saw her, the child has very slowly improved, but even so she is now (some months after infection) far from normal, reminding one of the unrestrained noisy children who form a section of the inmates of any institution for mentally defective children.

The second, a man of 36, driver of a motor lorry, had an illness in which I did not see him, but his medical man felt sure it was an attack of encephalitis lethargica, and from the description which he gave I agreed without hesitation in this view. The attack began with diplopia and passed over into protracted drowsiness. It left behind it a cycloplegia, from which he recovered slowly; also a liability to headache and giddiness which, with a sense of incapacity for effort, was so persistent that eighteen months after the attack he still felt unable to resume his lorry-driving, and had undertaken, permanently in his own view, less risky duties about the garage.

The third case was that of a maiden lady of about 40, of a quiet disposition, with almost excessive respect for the conventional proprie-

ties. More or less suddenly she was seized with an illness characterized by mild fever and persistent stupor, from which she emerged after many days. The late Dr. Michell Clarke, who saw her with me, agreed that a diagnosis of meningitis could be set aside (the cerebro-spinal fluid was clear and normal), and we labelled the condition 'encephalitis'. This was in 1915, but I have no doubt as to its general identity with the syndrome of recent years. There were two curious points about her mental convalescence: impairment of memory, so great as to destroy for many months her capacity for figures, at which she had previously been adept; and a total change of disposition, seen in a propensity for slang and mild immodesty, which also lasted for months. Indeed, I doubt whether she ever regained her memory fully.

Here, then, is a disease or group of diseases, probably infective in origin, capable of leaving behind very serious depreciation of the higher functions of the brain. It seems worth while to make a careful study of the origin of such a disease, not only in order to prevent its spread in these days when eases are so numerous, but also because of its possible bearing on the sources of some forms of mental deficiency. Epidemiological data seem to be singularly unhelpful. Between January and July, 1920, I saw 10 cases to which the diagnosis of encephalitis lethargica ought, I think, to be applied. Eight of these were in Bristol (several of them from one district, it is true; but no connection could be proved, or seemed even probable, between them), one in Somerset, and one in Gloucestershire. The ages varied from 2 to 68, and the conditions showed every conceivable variation. One child was taken ill while on a long visit to a comfortable country house, while a man who was attacked, and is still slowly recovering, was living in an unsavoury tavern.

The fact that seems to me likely to prove most significant is the high incidence of the disease after the war, and particularly in areas, like Vienna, which felt the stress of war keenly. Perhaps this may be related to the similarity of the syndrome to 'functional' complexes. At all events, I do not believe bare notification, with all its possibilities of error, will discover the data on which an understanding of the problem can be founded. The disease is so multiform that many cases will fail to be notified. The medical man in charge does not care to notify a case unless he is quite sure about it. It seems worth while, therefore, to go on collecting data of all kinds, and in this connection we may refer to a discussion of cases seen in Bristol by Professor F. H. Edgeworth, Dr. D. S. Davies, and others,\* to which the reports published here may be regarded as supplementary.

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\* *Bristol Medico-Chirurgical Journal*, 1920, 25.

## VI.—CASES OF ENCEPHALITIS LETHARGICA.

By STANLEY J. KERFOOT, BRISTOL.

Within a comparatively short period four cases occurred in my practice within a short distance of one another which appear to have been examples of the encephalitis lethargica syndrome. Two other cases, closely similar in many respects, are not reported because there were alternative diagnoses. But in the four noted here, it will be seen that a moderately acute illness, characterized by deepening lethargy, with mental disturbance and absence of focal cerebral symptoms, succeeded a period of vague ill-health with generalized neuritic pains.

*Case 1.*—K., male, age 65. Illness commenced late in 1919 with pains in the back, neck, and limbs, and increasing muscular weakness. The first symptom of importance to attract notice was slurring of speech. In the following three weeks he gradually became drowsy, unsteady on his feet, and muscular weakness increased. There was general malaise, and anorexia and foul tongue, but no vomiting. The knee-jerks were increased, also the abdominal reflexes. There was no ankle-clonus, or Babinski or Kernig sign. The pupils were sluggish, normal or dilated slightly. The optic discs were normal. He was very drowsy and stupid, but could be roused to take some interest in proceedings. At the end of three weeks he was confined to bed a good deal, and was more drowsy. The pupils were dilated and very sluggish. He could only be roused with difficulty, and one could not keep his mind on any subject. A few days afterwards he became almost comatose, and could just be roused for a few seconds. Marked rigidity of the neck, with Kernig and Babinski signs on both sides, ensued. There was general hyperæsthesia. He could not answer questions, but might just be roused to mumble some unintelligible words. The coma deepened, and he died after an illness of some weeks.

*Case 2.*—T., female, age 58, after a long period of diffuse neuritic pain, was taken ill in December, 1919, with increasing weakness and pains in the right lower rib cartilages. She was very tottery on her legs, and had a foul tongue and headaches. The speech was slurred, the pupils were dilated and sluggish. There was no optic neuritis. During the first three weeks increasing muscular weakness showed itself, with slight swelling of feet; no Kernig or Babinski sign or nystagmus was found, but the reflexes were increased. The mind was dull: she called a coat a shirt, but then recognized her mistake: there was no optic neuritis. After three weeks she became very apathetic and drowsy, with marked hyperæsthesia. For several days before death there was rigidity of neck and back, and marked Kernig and Babinski signs. Coma increased, and death ensued on Feb. 7.

*Case 3.*—L., female, age 56, was taken ill on Jan. 21, 1920, after a long period of neuritic pains, with headache and an apathetic condition which lasted a week or so: there was marked slurring of speech and drowsiness; the pupils were dilated and sluggish; the reflexes generally were increased. During the next three weeks the headaches and drowsiness increased; she was irritated if roused. There was rigidity of the neck and general hyperæsthesia. No nystagmus or optic neuritis was present. At the end of three weeks there was a phase marked by rigidity of neck and back, with positive Kernig and Babinski signs on both sides

and ankle-clonus on the left side only. The reflexes were very much exaggerated, with marked general paræsthesia. The mind wandered, and there was a sad facial expression. In another week she was apparently becoming moribund, with hypostatic congestion of the lungs: but after a few days there was a gradual improvement: the mind became clearer, and she was not so irritable, but she talked a lot of rubbish and remained apathetic still. Three weeks later I noted smiles, and she put out her hand to greet me with the remark, "I can sit up in bed". The lungs were clear and the mind bright, and she was making a good recovery. Two weeks afterwards the whole of the original symptoms recurred within twenty-four hours, and she developed dementia with definite delusions. She was removed to an asylum, whence she returned six weeks later, apparently well mentally, but still suffering from neuritic pains.

*Case 4.*—D., female, age 54, began to be ill in January, 1920, after a long period of 'neuritis', with headache and increasing muscular weakness. Slurring of speech was the first symptom to attract attention to the seriousness of her illness. The pupils were dilated and sluggish; the reflexes were exaggerated; no optic neuritis was found. During the next three weeks there was increasing drowsiness, with headache and irritability. Towards the end of this period there was rigidity of the neck and back and marked Kernig sign on both sides, with an extensor plantar response on the left side, and intense hyperæsthesia over the outer part of the left leg below the knee. She had delusions, and her mind was dull. Coma increased, also the rigidity of her neck. She appeared to be going downhill, but after a few days there was general improvement in mind and she was not so irritable: occasionally she smiled and was more pleasant. She was not so drowsy, but the hyperæsthesia was still very marked, particularly over the area in the left leg. There were no Kernig or Babinski signs after another two weeks, the rigidity of the neck had gone, and she answered questions intelligently and appeared to be making a good recovery. Four days afterwards, however, sudden coma ensued, with snorting, and with pin-point pupils. There was no vomiting and no definite paralysis of limbs. The pulse was soft and there was no albuminuria. Death occurred within thirty-six hours on March 9.

This autumn I have seen two more cases, both in elderly people, closely similar to the four here recorded, and occurring in the same area of Bristol.

## VII.—A CASE OF 'EPIDEMIC' ENCEPHALITIS.

By FRANK H. ROSE, BRISTOL.

On the afternoon of Thursday, March 25, 1920, I was called to see M. B., a little girl 4 years of age. I found a well-nourished, bright-looking child in apparently normal health, but whose temperature was 105°, and pulse 140. Her mother told me that on the preceding Monday she had been perfectly well, but woke up on Tuesday complaining of acute earache: this passed off during the afternoon, but she appeared rather feverish and a little quieter than usual. No other pain or trouble manifested itself during the Wednesday: and



on Thursday, the temperature being still high, I was asked to see her. I made a careful examination but could find nothing objective. I gave a prescription of salicylate of soda, and in the morning found that the temperature was  $104^{\circ}$ . This was maintained during the whole day and the next, but, beyond slight delirium at night and a general quiet demeanour, there was no sign of disease. On the Saturday, Dr. Carey Coombs kindly saw her with me in consultation, but could find no definite cause for the fever. The urine showed no sign of *B. coli* infection. At our request her mother took her out of bed and on to her lap for examination, and the child appeared terrified, and stiffened her body, not with pain but with terror. A similar phenomenon was noticed the previous evening when her mother gave her a warm bath: she became so rigid that her mother was alarmed, but she appeared to enjoy the warm water while in the bath.

On March 28 the temperature fell to  $102.5^{\circ}$ , and for the next four days swung irregularly between  $103.2^{\circ}$  and  $100.6^{\circ}$ . On the night of April 1 it suddenly dropped to below  $97^{\circ}$ , but next day was  $100.4^{\circ}$ , then with a slight fall rose to  $101.8^{\circ}$ ; on the morning of April 4 it was  $97.4^{\circ}$ . After that it gradually fell to normal and the general condition improved. The knee-jerks were normal until the temperature fell, since when they have been very much diminished, that on the left being practically absent. The plantar reflexes were normal. While there has been throughout an entire absence of physical signs of disease, there has been a singular mental hebetude; after the first day when, as a stranger, I examined her, and she replied to my questions, I could not get her to speak or to show her tongue; she was very good, submitting quietly to examination, but taking no interest in anything, and her mother told me that the change from her usual brightness was remarkable. On the subsidence of the fever she began to make brief and inconsequent remarks to her mother, but if asked to repeat a word that was not quite understood she would not do so. Later, if she made some remark, and her mother referred to some other subject of equal interest, she apparently took no notice of the second subject, her dulled mind occupied with the one only.

It was most interesting to notice the gradual return to normal mentality. She daily took more interest in her toys, and smiled more readily; but nearly a month after the onset of the illness she persisted one day in wishing to write an ordinary letter to an aunt whom she knew perfectly well was dead. Her speech also was very much slower and more dragging than normal. I was unable to obtain a knee-jerk during a visit about this time, and although she could walk she was rather unsteady. The leg muscles also were soft and flabby. She has since made steady progress and is now (four months later) practically well.



Oct. 1.—Six months after the attack the child is practically herself again, with certain exceptions. The musculature of the left arm and leg is perhaps very slightly diminished in size and firmness, and the mother says that the left leg occasionally “lets her down”. Both knee-jerks are unobtainable. She is more easily excited and, perhaps, more easily frightened. Her hair, which was wavy, is now straight and rather coarser, and “comes out in handfuls”.

### VIII.—A CASE OF ENCEPHALITIS LETHARGICA.

By S. A. TIDEY.

Recently I saw in Bristol a girl of 20, acting as barmaid in her mother's public-house. Three days before, she was taken ill with right supra-orbital headache, sharp and neuralgic. When I saw her this was less severe, but she complained of dizziness and noises in the ears. Her temperature varied from  $101^{\circ}$  to  $103^{\circ}$ . She vomited once only. For several weeks before, she had been feeling tired and unwell. Five days after the onset she was still feverish, the pulse-rate was 102, and she lay in a loose and flaccid attitude. She was very drowsy. Her eyelids drooped, and she complained that she could not keep her eyes open. She rambled in her talk a little; for example, she said “Good evening” at 10.30 a.m. At night she was quietly delirious, but in the day-time she could easily be induced to talk sensibly. The pupils were small, and they reacted poorly. All the ocular movements appeared defective, especially abduction of the left eye. The optic discs were normal. The neck was a little stiff, and there was a trace of hypertonus in the hamstrings. The tongue showed a coarse tremulous movement, and the arms twitched constantly. The reflexes were normal or diminished. There was no rash, and the viscera appeared normal except for a little abdominal tenderness. She became steadily worse, and died a week or ten days after the onset. No autopsy was allowed.

The case recalled that of a man under my care at the Middlesex War Hospital, Napsbury, in the winter of 1918–19. The chief points were somnolence, from which he could always be roused to answer questions rationally; retention or suppression of urine; inactive bowels; ophthalmoplegia with drooping of lids; and some affection of lower limbs—loss of knee-jerks, I believe. After a few days' illness he died rather suddenly. The post-mortem examination disclosed no gross changes in the brain or elsewhere, but a micro-organism recovered from the intestinal contents was thought to be the *B. botulinus*.

## EDUCATION AND ITS RÔLE IN THE PREVENTION OF NEUROSES.

By J. ERNEST NICOLE, MANCHESTER.

THE many factors and mechanisms concerned in the production of neuroses as revealed by psycho-analysis are becoming common knowledge, and even the complicated terms coined by psycho-analysts may almost be regarded as currency in the speech of to-day. But it is to psycho-analysis as a prophylactic measure that the medical man, especially the family doctor whose position often requires him to act as general adviser too, can most profitably turn. The curing of hysteria is a long and tedious process involving a great expenditure of time and much technique, but the application of the barest of psycho-analytical principles will do much towards correcting an education that is obviously inadequate to the present-day difficulties of mankind.

There are two main instincts with which education has to deal: (1) The sexual instinct, understood to include all such higher aspects of sex as love, maternal affection, the attachment of children to their parents, and certain reaction formations as exemplified by hatred and jealousy when having a sexual origin; and (2) The ego or self-preservation instinct. We find to a lesser degree a third instinct which is more developed than inhibited by education—this is the herd instinct. The first in the adult is present as what might broadly be called the love-tendencies of the individual, and is the basis of the original Freudian psychology. The second becomes the will-to-power, to which Adler ascribed all neuroses as a system of psychical compensations for a reality inadequate for the satisfaction of the power instinct. The third instinct is the one that later becomes the social tendency that binds individuals together into efficient communities.

As the growing child develops, any wish or desire prompted by these instincts, but which is considered as immoral, has to be repressed and subsequently sublimated. That is, the wish becomes forgotten and unconscious, and the original interest invested in such 'wrong' subjects has to be diverted and given an outlet in some other way which is admissible to ethics and yet still satisfies the original trend: for instance, nursing in a children's hospital as a satisfaction for a spinster's repressed desire for offspring. When, however, such sublimation is not successfully carried out, the repressed wish still makes

its effect felt, and strives for recognition in a subtle and disguised way, either by causing a neurosis, or else by merely influencing the individual's emotional reactions in a way not in accordance with his rational aspirations.

In so far as it is against sex that education exerts most of its restraining influence, it is not surprising that it should be found at the root of so many of the mental difficulties of childhood. Although the common tendency is to place the period of awakening sexual interest at ten or so, we must realize that it occurs at a much earlier age, and that an apparent innocence at ten is often due to the repression of a well-marked interest at the age of five. This sexual development of the child is therefore a very prolonged and complex one, which follows some such lines as these: First of all, the child's interest is naturally directed towards itself, and its thoughts find little with which to occupy themselves in other people. After a time, however, it starts to repress this self-love, and becomes attached to another person similar to itself, that is, of course, its parent of the same sex. From this, it passes to its parent of the opposite sex. This stage now lasts a considerable time, but at last, under the influence and pressure of its educational surroundings, it represses again, and turns to others outside its family. Thus, at first it gets drawn to the members of its own sex, but finally fixes its love-tendencies on a member of the other sex. A little girl's successive love objects would therefore normally be: herself, her mother, her father, her sisters, her brothers, other girls, and finally boys.

But since the appearance of each attitude demands the repression of the preceding one, we understand the sudden attack of foppishness which most children display at some time or another, when they take a great amount of interest in their clothes, hair, appearance, and so on. This stage is a sublimation of the self-tendency of early sexual development. The infantile tendency of exhibiting one's own form is frequently sublimated into public speaking, acting on the stage, or posing as a model. Repression of parental interest leaves behind the framework of what we call filial devotion and attachment. When repression of love interest in the same sex occurs, the sublimation products are all the conventional worldly traits of character that render possible the social links and interests existing between members of the same sex, such sociability being impossible between one sex and the other. The partial sublimation of the power instinct, on the other hand, gives rise to desire for success, the wish for personal influence of one's self over one's subordinates: in other words, to ambition. Indeed, the choice of a profession often appears to be influenced by unconscious repressions: for instance, a repressed cruelty instinct may lead its owner to become a butcher or a surgeon.

Similarly a dishonesty trait may dictate the adoption of legal studies. Such a series of important repressions to be gone through successfully before normal adult character is reached presents, therefore, many pitfalls to the developing child who does not get the best possible help in the shape of a rational education.

But it frequently happens that at some stage or other of a child's development an arrest takes place, and no further stage is ever reached. This stoppage at a certain mentality, without subsequently developing another, is known as a fixation: and such infantile fixations are much more frequent than might at first sight appear. A fixation, say, for one's own parents gives rise to an excessive form of filial attachment, which the world is very apt to regard as highly praiseworthy: whether it be so or not, the fact remains that it is a sign of a faulty and erroneous development of the child's mentality. A fixation for one parent may be partly departed from by attempting to realize in others the original parent ideal, thus causing the individual in later life to be unconsciously attracted by those that fulfil this ideal, though this is an entirely unconscious tendency, which may be against all the conscious dictation of reason. This results also in an instinctive aversion to those, however fine characters they may possess, who do not concord with the parental image. In the event of the fixation having been for the parent of the child's own sex, the resulting ideal will be one which can only be truly satisfied by a member of the same sex. This leads, therefore, to a tendency or an attitude from which very few people indeed are entirely free, and it is homosexuality. This term is applied to a tendency, a leaning, a taste if you like, and can therefore not be considered as descriptive of only the actual demonstrations of that tendency, or the acts to which it prompts. Homosexuality, therefore, is the pouring of a natural fund of affection on to people who would in the normal way have been chosen principally on account of their belonging to the other sex, whereas they have in fact been selected because of their belonging to the same sex.

Let me illustrate by an example, an abstract from a long case:—

A woman of the working class came to me and stated she had had an unhappy childhood on account of a drunken father; she was extremely strictly brought up, and in order to escape her misery married at twenty. Her husband is a man whom she respects greatly and admires. She has two sons, the younger of whom came rather against her wishes, yet she loves him dearly. He is home now from the R.A.F. She is forty-two, and is suffering from sleeplessness, marked depression, "shocking" neuralgia, and, above all, an uncontrollable temper. She is angered at every act of her husband, and "goes for him" in an entirely irrational way. Also she relates the following dream: "I am wrapt in a fur coat and I am in an aeroplane at night with a pilot by my side. I have orders to cling to a certain parcel, and I do so. I alight on the seashore with my parcel". Now, as regards analyzing this dream: a fur coat suggests warmth: she feels guilty for



being so frigid towards her husband, as she appreciated she ought to love him, but somehow she cannot; here her frigidity is changed into warmth, a wish fulfilment. An aeroplane reminds her of her son's entry into the R.A.F.; she was loath to lose him, but his father wished him to go; this was the cause of one of their biggest quarrels; her being in an aeroplane, then, pictures the unhappiness of her married life. 'At night' suggests the same thing, for her husband is away all day, and it is only when he comes home at night that the "rows" begin. The parcel is associated with her son, who is littering the house with parcels and souvenirs from the war; he will not unpack, as he is engaged, and hopes to fix up his own home soon. She is dissuading him from doing so, for she hates the thought of losing him, especially as his delicate and effeminate ways remind her so of her mother, whom she dearly loved all her life. The order she received in the dream she feels sure must have originated from her mother, for she never tolerated orders from anyone else. We see, therefore, a maternal influence that has caused her to enter into this aeroplane, i.e., married unhappiness—and concentrate on this parcel—i.e., her son. The pilot who is driving her reminds her of her son's chum in the R.A.F., who is very rich compared with her boy. The pilot, therefore, symbolizes wealth, and expresses the idea that were she to have wealth by her side her boy would not work, and, not being independent, could not marry. The seashore reminds her of Yarmouth, the only place where she spent a holiday without her husband, and this expresses attained peace and happiness.

This dream, therefore, shows that her maternal influence is responsible for her present unhappiness and her violent attachment for her effeminate son. She wishes to keep him by her, yet to separate from her husband; and were she wealthier her hold of the boy would be more secure.

Further investigations show that as a child she was wildly in love with her mother, but she attempted sublimation on to a lady next door, who treated the child very well. The disparity of age was corrected by a further transferring of affection to the daughter next door, who, however, did not return the child's love. This attachment lasted till the age of fourteen. Then we find a blank, colourless life till she was thirty-two, when she fell violently in love with another woman, who approached closely to her maternal ideal. At thirty-eight this so-called friendship ceased, and she has had no more since.

We see, therefore, the maternal ideal running through from her mother to the lady next door, her daughter, another woman friend, and now her son. Her husband, of course, had not the necessary traits pertaining to that ideal, besides the fact that he was of the wrong sex.

This provides us with an excellent example of how a faulty sublimation in childhood may result in the most unhappy of careers without the individual being aware of the cause, and therefore without possible remedy. We must appreciate, therefore, how these early and infantile tendencies, even phantasies, are kept relegated in the unconscious, and from there, in the event of sublimation being imperfect, are capable of influencing consciousness.

We have thus a sort of double personality, the adult and the infantile minds co-existing. Hence, the cause of an adult mental



symptom will be found in a repression that is unconscious, and therefore infantile. It is this shadow, so to speak, of one's child character that reminds us daily of the necessity for a correct education which will mould these repressions into the forms that will least imperil subsequent adaptation.

We note in the growing child the presence of two psychic systems, the one primitive and personal, and the other acquired and impersonal. Thus the primitive infantile gratification of a desire or wish is to imagine its realization, to find its fulfilment from within, and therefore to ignore in the process external relationships to others. The other system, which is a product of education, is the one that tends to make use of environmental conditions to procure actual and material satisfaction; it therefore takes into account outside objects and events, and utilizes them for a definite purpose. The first system is entirely personal and subjective, whilst the other is impersonal and therefore objective. We see the growth of the second system when we observe how a child is no longer satisfied with the imaginative games that used to please him a year ago. The first elementary and imaginative system remains in its primitive condition throughout life, and as it affects individual adaptation less and less, it becomes repressed, and forms the basis of the adult unconscious. The second acquired and objective system, developing further, becomes modified by experience and education into the rational and reasoned part of our mind we call conscious. The first system is normally controlled by the second one; yet we see, of course, numerous instances where the second reasoned system falls entirely under the influence of the first irrational and infantile one.

At a very early age—about five—the first system has crystallized itself, so to speak, into a few sharply defined tendencies, which are ultimately expressed only through the second or objective system: though they sometimes are satisfied by the first system, as in the wish fulfilment of dreams that are infantile types of imagination. And all our various trends and activities can be traced back to a limited number of primitive tendencies residing in the first or infantile system.

And when we divide human personalities into the introverts, who turn within themselves, reason, and thus apply themselves to the gaining of power, and the extroverts, who go out to their environment and thus adapt themselves emotionally (Jung), we must expect to find the foundations laid for both extrovert and introvert characters at an early age when certain impulses begin to predominate in the first system over other tendencies of less importance to the individual.

It follows that the difference between introvert and extrovert as laid down in childhood is not only one of opposite ways and tendencies, but also one of mutual misunderstanding, which plays a sad part in

causing half the sorrow and unhappiness in the world. We see that the strength of the introvert is the weakness of the extrovert, and on account of thus completing one another they are particularly apt to intermarry. Everything goes well as long as husband and wife are merely back-to-back fighting fate, but the day they have won and overcome their difficulties and assured their position, they turn to one another expecting to understand each other, and yet hopelessly fail because they are so different. This accounts for so much misery occurring in married life after years of conjugal felicity in spite of—we should say, of course, on account of—the struggle for life. It is this marked contrast between these two types of character, which contrast finds its starting-point in infancy, that shows the absolute and urgent necessity for an individual system of education, one that recognizes these contrasts, and treats each mentality accordingly. Thus, in order to prevent deficiency of adaptation from, say, an excessive extrovert character, the developing child should receive an education tending towards introvert characteristics. But in those circumstances, where a hold of that child is required, such hold can only be obtained through appealing to that child's adaptation processes, that is, its extrovert tendencies; thus, in such a case as this, we should try to develop introvert trends by appealing to the extrovert character. Thus and only thus can one ensure a fair equilibrium between the introvert and extrovert characteristics; for it is the undue excess of one over the other that spoils the powers of adaptation.

The proper recognition of the importance of these primary repressions of childhood will, in time, lead perhaps to such a regulation of educational influences brought to bear upon the developing child as will avoid the formation of faulty repressions. In this way, numerous traits of character that are really reaction formations could be reduced to a minimum. Instances of this are legion, and we need mention only a few, such as Puritanism, meanness, selfishness, or religious mania, all of which are undesirable characteristics. But we cannot entirely prevent reaction formations occurring; and since generosity, altruism, honesty, and so on, may also be reaction formations, we should therefore aspire to an education that will guide sublimation or reaction formations in advantageous rather than disadvantageous directions.

Careful observation of the formation of reactions and of sublimated interests will prove a guide to the ascertaining how much the infantile or first psychic system is still making its influence felt; excessive predominance of it will result in an outlook upon the world that will be too subjective. Instance, the infantile mentality of savages, who appreciate new events or objects only in so far as they

may be of personal interest, or may have some significance to their subjective attitude. The constant observing of objects from a personal point of view, irrespective of those objects' intrinsic or general worth, is naturally a bar to proper adaptation, and should be eliminated by education. But even if it were too strong to be entirely repressed, then at least this subjective attitude should be assisted towards sublimation in a more useful direction, such as art. The subjective attitude is well shown by the poet, for whom a rose, a sky, a brook, an insect, are of no specific significance, but are considered as symbolical of subjective and abstract ideas he wants to express. The general importance in life of symbolism and phantasy—all of infantile origin—can certainly not be denied. From what we have said before, it follows that the mental contents of the adult unconscious, and still more so of the child's first system, cannot be described as either moral or immoral, but only a-moral. Hence, since the child's instinctive tendencies are subjective and primitive, we cannot call them immoral because they are opposed to arbitrary moral considerations which the child does not recognize, let alone accept. It is only the contents of the newly acquired objective system, the system that places the child in relationship to others, that we can call right or wrong.

The application of this principle to infantile sexuality brings us to realize the necessity for a careful sexual education, that is, enlightenment. We must appreciate how, in order to ensure a correct mental evolution, we should never fear or shirk a difficulty, but should face it boldly: that is, repression should be avoided, and the subject considered. But the child of to-day could hardly do this with sexuality: he is too hampered by his surroundings: his curiosity concerning a vital subject is not wrong, it is entirely justifiable, arising as it does in the first place from an innocent and natural wonder. But the mystery and secrecy with which we meet his frank inquiries cause that child gradually to regard the whole matter in the light of a shameful and blameable tendency, thereby laying for himself the foundation of future neuroses and troubles of all descriptions.

It does not mean that a morbid interest should be encouraged in the child, but simply that enough assistance should be given to make a difficult subject, constantly playing on the child mind, one of ease and therefore of comparative unimportance, that once elucidated will only receive its just and limited share of interest.

Two other more direct and immediate, but still detrimental, results ensue from this. The child first of all loses confidence and faith in the parents to whom he turns in his natural curiosity: indeed, I should think that however well children hide the fact, yet most have lost their trust in their parents by the time they are five or six years

old. As a second result, the parents lose all further influence over the child, except that which comes from enforced obedience, and they must therefore abandon all hope of ever controlling again the youthful mentality entrusted to their care.

Although we appreciate that the energy and interest originally invested in sexual subjects can, and often should, be transferred, diverted, or sublimated on to other, perhaps social, interests, yet we can do no more to assist this transferring of mental energy than provide it with a new and proper path: and it is but courting disaster to believe we can force this change by pouring forth a vain and lengthy string of 'thou shalt not's'. That we should help interests to develop in connection with higher subjects, well and good: but let us beware lest we overestimate the value, if value there be, in forbidding that interest being invested in lower subjects. That way of flinging blame broadcast for tendencies that are not even offences, leaves behind a sense of shame that can never be washed off. It is more often than not the cause of self-consciousness, and of those reticent and secretive dispositions to which we owe so much of the misunderstanding that occurs in the world to-day.

We have, however, to beware of the exclusive interest arising from the teaching of sexual principles apart from all other sciences, for such an interest may well develop into a morbid attitude that, so far from detracting from the power of sexuality, will enhance it; and so we should procure sexual enlightenment, not as a study of its own, but as a small part of a natural science that should be taught in every school and college. We should thus avoid the detrimental effect of knowledge obtained from doubtful sources and against the inculcated principles of education. Does not this want of frankness in connection with sexual subjects lay the foundation for the neurotic troubles occurring in later life, examples of which are so frequently to be found in young married women?

What can we say about the early education that absolutely forces the developing girl child to do violence to its natural instincts, and teaches it to consider this primordial and essential tendency as one to be shunned and regarded as against all moral dictates of modern ethics, except that this education will create an attitude of mind that in later years must be severely jarred and upset by the reversal that takes place when those very tabooed and so-called loathful subjects are reintroduced by a husband who exemplifies the best and highest of mankind to the young and blushing bride?

We have seen once again, though from a new point of view, the truth of the statement that, in order to be of use to the individual, education should be individual. And for this we must extend our study in the hitherto little explored fields of child mentality. We



might note here a slight practical difficulty in recognizing introvert from extrovert characters. For instance, the extrovert may exhibit a considerable amount of reasoning power of which use is constantly being made; but one will find this reasoning of the extrovert is not for the purpose of true decision or deliberation, but is to justify, by means of reason that will concord with general criteria, the impulsive attitude that has already been adopted. Thus does an extrovert attempt to prove the justifiability of his emotional impulsiveness by means of logic and reason. The question is, therefore, not whether a particular individual reasons much or little, but whether such reasoning came first or not.

Having thus identified the type of psychology belonging to an individual, we should next proceed to recognize the general trend of his unconscious processes by means of investigation of reaction formations, symptomatic actions, and dreams. We may here point out that dreams not only show past mental processes, but show present and unconscious thoughts that will take part in the subsequent production of future acts. For instance, a woman who was repressing a normal sexuality dreamt she was in a position which necessitated resisting a man she loved. She saw in that dream a door—which symbolizes a way out of a difficulty—open and disclose a beautiful woman, with whom she went out. This dream, therefore, suggests that homosexuality would be a means of quietening the normal aspirations of that woman. Indeed, it turned out that a fortnight after having this dream, she fell violently in love with a girl whom she had known in an indifferent way for fifteen years.

The further application of such a constructive psychology as has been outlined by Jung to be used in the readaptation of a mentality according to its 'life tendencies' (Jung) is rather problematical as far as child education goes, on account of the infancy of the subject and the element of uncertainty that still clings around its results. But when we have realized the fundamental traits of human character, and the comparatively few ways in which these can be sublimated, we will next attempt to urge and direct a particular child in the paths of sublimation more fitting to its mental attributes. We must never forget, however, that a sublimation cannot in any case be forced, and all that can be done is to open up the most appropriate sublimating paths, and hope the individual will take them.

The correctness and extent of a sublimation is of course controlled by three factors: (1) The strength of the original tendency; (2) The strength of the repression; and (3) The opportunities for sublimation. As regards the first one, the strength of the tendency, we cannot diminish it any way; but what we can do is to prevent its becoming reinforced by undue excitation. As one instance only, I will mention



the kissing of the palms of a child's hands. It has been shown repeatedly that the child's excitability is widespread, in early years at any rate, all over its body, and we can but condemn such excitations as are caused in all innocence and ignorance by overfond parents and nurses. In the same way we should avoid strenuously such housing and sleeping conditions as are found in certain walks of life, and the reading of a kind of literature that will awaken interest in a wrong and morbid way. As regards the strength of the repressing influence, we have noticed that if a repression be too forced and sudden, the sublimation is almost sure to be faulty. So we must try to diminish the intensity of a repression by cultivating more freedom in connection with those reprehensible subjects. Also, we should not be in too much of a hurry: how can we expect a child to become moral all at once, for that is just the very attitude that would precipitate and upset a beginning repression. The providing of suitable forms of sublimation from a careful study of the child's character and tendencies we have already mentioned. One thing more should be said. Forms of sublimation, in order to be successful, should not be too closely related to the repressed material, for the strength of associations between the two will tend to bring up to light that which the individual was trying to repress. On the other hand, the path of sublimation should not be too far, as then the interest and energy bound up in the original and repressed material would not be so easily carried over such a distance, and the means of linking the two would be too precarious to ensure a correct sublimation.

To sum up then, we may say that we should, from an educational point of view, appreciate the importance of the unconscious mind: its characteristics in the different types of psychologies; the significance of the primitive tendencies responsible for the faulty repressions, the signs of which must be recognized: the normal and abnormal developments of child mentality and their influence on adult character; and finally, the necessity for an individual and rational education that will help to close the wrong paths, and open up the right ones for the various sublimating processes essential to human progress and development. Moreover, it is not enough for a few people to become versed in analytical psychology in order to correct in children the faulty influences of an ignorant home education: for it is only when everyone is acquainted with the psychic principles that will help towards the avoiding of developmental errors, that we may cease to do harm and perhaps do a little good.

## FAMILIAL TABES DORSALIS.

BY J. LE FLEMING BURROW, LEEDS.

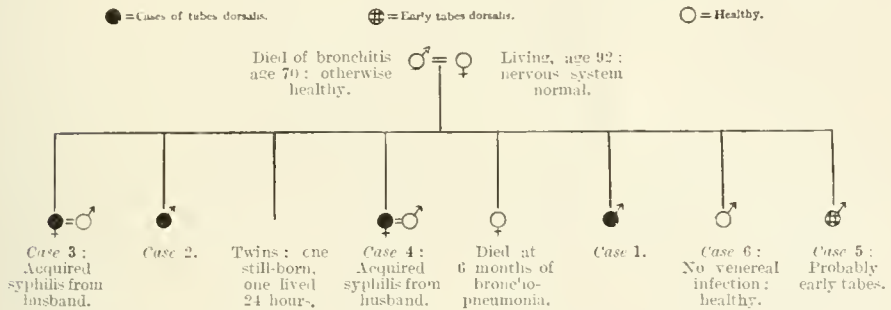
THAT heredity is an important factor in the incidence of nervous disease cannot be gainsaid, though the discoveries of modern bacteriology have shed the light of knowledge in many dark places where conjecture was lacking in material proof of an acquired infection. Modern thought turns with increasing respect to the ultra-microscope for evidence of organisms as a cause of disease, and present-day theories anticipate much that will most surely become commonplace fact when protein chemistry advances far enough to simplify many 'reactions' which now rest upon mere supposition. In our concentration upon the study of parasitic organisms as disease-producing agents, we are apt to thrust into the background the obscure factors of tissue-peculiarity, 'sensitiveness', and selective action, or in other words, the state of the soil in which the seeds of disease are sown. Neurology has always recognized the potent influences of family tendency and selective action in the causation of chemical and microbial lesions in the various highly specialized units of the nervous system. 'Sensitiveness', tissue-affinity, and cell defence are almost incalculable factors in disease. We cannot form any exact estimate of how much damage will result with a known dose of toxin in any individual, and a repeated dose will have an effect differing at least in its intensity from that of the first—a phenomenon now well recognized in the solution of all problems of acquired and artificially produced immunity. If the source and virulence of any infective agent be known, there are still disturbing reactions, such as tissue sensitiveness and other biochemical reactions of defence, which will confound the clinician in his estimate of any resulting lesion.

Family tendencies to certain diseases have been much discredited by the findings of modern bacteriology. There are notable exceptions, such as hæmophilia, pseudohypertrophic paralysis, and so on; but tuberculosis and other microbial diseases are known to fail in their attempts to pass through a healthy placenta to the fœtus. It is easy to believe that certain strains of bacteria acquire a selective action upon particular tissues. Cases have been reported where several patients, friends not related by tissue-continuity, have acquired syphilis from a single source, and where the late effects have been general paralysis in all. An attractive way of explaining such clinical histories would be to associate a certain type of virus with a

definite selective action upon certain tissues, a course made all the more credible by recognized precedents—for example, tetanus, etc. Since the demonstration by Noguchi of the *Spirochæta pallida* in the brains and cords of general paralytics and cases of tabes, findings confirmed by most other neuropathologists to the extent of about 80 per cent of all cases of these diseases, there is a tendency to discredit any other factor except mechanical and other influences such as vascular and lymphogenous portals of entry to the site of the lesions.

When, however, several members of a family born of healthy parents develop tabes—following upon a clear history of acquired syphilis in four cases, and all from widely different sources—then surely an explanation must be sought in the realms of speculation, such as family- or tissue-peculiarity; clearly a similar strain of spirochæte cannot be held accountable in this set of circumstances.

#### GENEALOGICAL CHART OF THE X FAMILY.



It may be remarked that in all these patients there has been not only the same disease, but a similar type of tabes, uncomplicated in all by paralysis, marked optic atrophy, gummata, or aneurysm of the aorta. The following abbreviated notes form a record which may be allowed to speak for itself.

**Family History.**—The father, a member of the medical profession, was a healthy man until he reached the age of 70 years, when, one cold winter, he succumbed to an attack of acute bronchitis with heart failure. The mother is a delightful old lady, now alive, and active in all her faculties at the age of 92. She suffered from scarlet fever as a young girl, but since then she has never ailed more than with an occasional winter catarrh. She is a little deaf to-day, but takes her daily walk and does her household shopping on foot. I had the opportunity of examining her, and could find no physical signs of disease in any organ from a superficial examination of her chest and the usual routine examination of her nervous system. The arteries were very healthy for her age, the pulse good in volume, and

the sphygmomanometer read 160 mm. of mercury for her systolic pressure.

*Details of Family of Mrs. X.—*

1. Daughter (Mrs. A. T.), now dead, aged 67, 'stroke'. Examined in 1914 at age of 63 and found to be definitely tabetic.

2. Son (W. H. X.), now 67, first examined in 1914 at age of 61, a chronic tabetic.

3. Twins, one still-born; the other lived twenty-four hours, weakly at birth, no rash.

4. Daughter (Mrs. W.), now 63, examined in 1914 and again recently; definitely tabetic.

5. Daughter, died at age of six months of bronchopneumonia.

6. Son (G. X.), the original patient, examined in 1914, age 51, and pronounced to have tabes. Re-examined November, 1920, now 57.

7. Son (C. X.), age 55, healthy.

8. Son (R. L. X.), age 46; suffers from early tabes.

There were no other children and no miscarriages.

### CLINICAL NOTES UPON THE INDIVIDUAL CASES.

*Case 1.*—The first member of the family to come to my notice was No. 6, G. X., admitted to the General Infirmary, Leeds, in April, 1914, under the care of Dr. Barrs, to whom I am grateful for permission to publish the clinical notes.

The patient, whose age on admission was 51, a well-nourished man, complained of stabbing pains in his legs, and inability to stand for long without support, or to walk without assistance on either side. He spoke in a natural manner, with some lack of facial expression, and demonstrated that he was not paralyzed, but drew attention to the unsteadiness of his legs, which he said were out of his proper control.

**History.**—Had measles and scarlet fever as a child. Acquired syphilis when 27, primary sore with secondaries. Treated for about a year with mercury and iodide; no further manifestations.

He first noticed the beginnings of his present complaint ten years ago, at the age of 41. He had some difficulty in walking downhill or downstairs. At dusk he was uncertain of the ground. On shutting his eyes he at once became unsteady, and would fall unless there was some support handy. A few years later he felt a curious tight sensation across the upper part of his body and the lower ribs, which has persisted since, but he has ignored it of late. About five years ago he had trouble in starting micturition, but this has passed off lately because he has always been careful to urinate at regular times, finding that he could not tell when his bladder was full. On a few occasions the urine has dribbled and wetted his clothes, but there has been no retention. There have been 'rheumatic pains' in his legs, especially at night-time, sharp darting pains which come and go, rarely disturbing sleep. He has gradually lost the proper control of his legs in walking, and latterly in standing. He says that his difficulties are due to numbness of his feet and uncertainty of knowing where to place them.

**Objective Examination.**—No external scars except a doubtful one on the glans penis, no nodes in the long bones or skull.

**NERVOUS SYSTEM.**—Memory, attention, and ideation good. No headaches, no fits. Speech excellent; writing a little tremulous, but does not differ in any other way from that of early years.

Gait is wildly ataxic; the legs are awkwardly pulled up, and he steps high, bringing the feet down heavily in attempting to walk. He requires support on either side, and leans heavily upon his helpers. The arms are almost normal until the eyes are shut, when he is mildly inaccurate in finger tests.

**Cranial Nerves.** I: Normal. II: Normal in acuity, fields, and fundus; the latter is a little pale, but definite atrophy is not diagnosed. III, IV, and VI: Pupils small, slightly unequal, react on accommodation but fail to react to light; no ophthalmoplegia, no nystagmus. V: Corneal reflex sluggish, no motor change. VII: Expression rather wooden, no paresis. VIII: Slight nerve deafness, no vertigo. IX, X, XI, XII: All normal, tongue steady.

**Motor Functions.**—Marked hypotonia in both legs, none in arms, inco-ordination as above. Deep reflexes: Jaw-jerk present. Biceps-, triceps-, supinator-jerks obtained on re-enforcement. Knee-jerks absent, ankle-jerks absent. Skin reflexes: Scapular obtained, abdominals sluggish (adipose patient). Gluteals, cremasteric, and bulbocavernosus reflexes not obtained, probably absent. Plantar reflexes very sluggish, but flexor response obtained on warming foot.

**Sensory Functions.**—Upper limbs: Full sensation except deep-pressure pain, which is practically absent; joint and muscle sense to passive movements, etc., good; no astereognosis; tuning-fork vibration not felt. Lower limbs: Total loss of joint and muscle sense below knee; marked analgesia on deep pressure over nerve-trunks; some anaesthesia of soles; hypo-aesthesia to rough tests with hot and cold tubes in lower leg on both sides.

**OTHER SYSTEMS.**—Healthy. Arteries generally a little thickened; systolic blood-pressure, 150 mm. of mercury.

Wassermann reaction with blood-serum negative.

Lumbar puncture not required for diagnosis, and not done.

**Subsequent History.**—During the late war I was unable to keep in touch with him, but I re-examined him on Nov. 1, 1920. He is now much worse than he was six years ago, and does not leave his chair except for essential duties. His arms are now inco-ordinate, and his writing is worse. He has a Charcot's shoulder affection, and also an enlarged painless elbow, both on the left side. These joints grate on movement, and are easily dislocated. His sight is good, and the pains are much better. His speech and mentality are normal. All signs are much as they were on the first examination, except for the arm condition, which came on quite suddenly about a year ago. The joint sense is quite good in the fingers, even those of his left hand. Pallanesthesia is noted in all four limbs. There are no trophic ulcers.

**Case 2.**—W. H. X., elder brother of above. Examined June 9, 1914, when his age was 61. The patient states that he has 'locomotor ataxia'.



**History.**—Has had measles, scarlet fever, influenza. At the age of 27 he acquired syphilis from a different source than in the case of G. X. He was a medical student at the time, and was quite *au fait* with his disease and its treatment. He was carefully treated for fully a year and a half with perchloride of mercury, black wash, and iodide afterwards. No further symptoms.

About the age of 46 he found that in writing his hand occasionally went off at a tangent. He noticed unsteadiness in standing to wash his face, and felt very awkward at a concert about that time when he had to find his seat with the lights turned low. He gradually developed a difficulty in crossing a road when he had to look up and down the street to notice if vehicles were passing; on other occasions he found that his eyes were most important help to his walking. Since the age of 56 he has been unable to walk in the dark. For the last four or five years he has had pains in his legs. For some years he confesses to a girdle sensation, and his sight has not been so good lately.

### Objective Examination.

**NERVOUS SYSTEM.**—Memory good. Speech perfect, higher centres unimpaired. Mask-like expression a feature. No fits. Sexual appetite retained. No bladder or rectal trouble, no stomach symptoms.

**Cranial Nerves.**—Pupils small, regular, centric, fail to react to light but move on convergence. Fields normal to rough tests. Discs: slight pallor, but no definite atrophy. All other cranial nerves healthy. Tongue steady.

**Motor Functions.**—Power good, joints perfect. Hypotonia in arms and legs on passive movement. Deep reflexes: Biceps- and triceps-jerks much reduced, but obtained on re-enforcement. Knee-jerks and ankle-jerks absent. Abdominal reflexes sluggish, cremasteric reflexes obtained. Plantar reflexes doubtful; any response is flexor.

**Sensory Functions.**—Great impairment of deep sensibility in lower limbs: the patient cannot imitate the positions of joints passively moved. Deep analgesia. Total pallanesthesia in arms and legs. Some preservation of joint sense in hands; no gross cutaneous anesthesia. Gait ataxic, but not remarkably so. He at once becomes unsteady when his eyes are closed.

**OTHER SYSTEMS.**—Healthy. No aneurysm.

Wassermann with serum negative.

**Subsequent History.**—Re-examined November, 1920. The patient's condition is little changed in the last six years. All functions are about the same; he thinks, however, that he can walk a little better than he could a few years ago. There has been no alteration in the optic discs, which are pale without definite atrophy.

**Case 3.**—Mrs. A. T. Examined June 9, 1914, her age then being 63.

**History.**—This patient was perfectly well until her marriage at the age of 18. She contracted syphilis from her husband. There were definite specific lesions, chancre, condylomata, falling of the hair, and iritis. She was carefully treated for at least six months by calomel and opium, afterwards by a course of potassium iodide, and was apparently cured. Her hair grew again, and her general health improved in a most striking way.

About the age of 50 she became unsteady in her walking. She

described her sensations as "like walking on a cushion". A few months later she complained of "darting pains" in both legs: there was also some loss of bladder sensation and occasional incontinence of urine. Three years later she sustained a severe compound fracture of the leg owing to a slight fall in her kitchen: the fracture united with great deformity after considerable treatment. She sustained another fracture, not so severe, two years later, as a result of a second trivial fall. The husband died as the result of an accident. He was not tabetic.

### Objective Examination.

**NERVOUS SYSTEM.**—A typical case of pronounced tabes dorsalis. Patient is profoundly ataxic, and unable to stand without support. Complete loss of pressure pain in the legs. No tendon-jerks obtained in either the upper or lower limbs. Cranial nerves healthy except that the pupils are unequal, irregular, and of the Argyll Robertson type. Mental functions unimpaired, though she is depressed at her constant invalid state. The tongue and lips steady: handwriting good.

*Subsequent History* (given by her daughter who nursed her during the latter years of her life).—The muscular pains became gradually worse; at times she had crises of pain causing her to scream in agony, and only obtained relief by hypodermic injections of morphia in increasing doses. Between the years 1914 and 1918 a few slight strokes occurred, but there was not much permanent paralysis as a result. In the periods of freedom from her attacks of pain she was mentally very active, and played a good game of whist, on which she was particularly keen. There was complete incontinence of urine during the last four years of her life. She became aphasic after a severe stroke, but recovered speech some few weeks later. Death occurred on Sept. 14, 1918, following a severe apoplectic attack, in her 68th year.

*Case 4.*—Mrs. W. Examined June 9, 1914, her age then being 57.

**History.**—This lady had measles and scarlet fever as a child, but was healthy afterwards until her marriage. Her husband had acquired syphilis previously, and suffered from symptoms of constitutional syphilis after marriage. His wife's health became affected, but she had no definite chancre. Both patients were treated over a period of many months by mercury and iodide. The wife suffered from sore throats: her hair was shed, and there was some skin rash, but her health subsequently improved. There were no children of the union, and no miscarriages. The husband is not tabetic.

At the age of 55, two years before she came under observation, she noticed the onset of unsteadiness when she walked. She could not stand in the street, nor turn round sharply. Her sight deteriorated, but she is able to see fairly well yet, even in a poor light. There has been a little difficulty in starting the act of micturition.

### Objective Examination.

**NERVOUS SYSTEM.**—Mentally good. Speech perfect. No fits. Cranial nerves: No palsies: Argyll Robertson pupils; discs pale, but vessels of

good size; tongue steady, no tremor. Motor functions: No paralysis; marked inco-ordination in the movements of the legs to all tests; hypotonia in the leg muscles; knee- and ankle-jerks lost; plantar reflexes flexor in type. Analgesia on deep pressure over the nerves and muscles of the legs. Upper limbs healthy in function, and all arm reflexes present.

*Subsequent History.*—Re-examined Nov. 2, 1920. The disease has progressed slowly since the patient was first seen six years ago. She cannot go out of the house now because her gait makes her an object of interest to passers-by. The bladder disorder is much worse; there is troublesome incontinence, with the occasional passage of blood and slime. The legs are much more inco-ordinate, and the disease is now affecting the upper limbs, tendon-jerks being obtained with great difficulty in the arms, and there is now some hypotonia in these members. There is no mental impairment, and no trophic change. For personal reasons no Wassermann reaction with the blood-serum or spinal fluid was proposed to the patient.

*Case 5.*—R. L. X., age 46 years.

*History.*—This patient had a healthy boyhood until the age of 15, when he was supposed to have acquired gonococcal urethritis, which was promptly treated. He twice acquired a definite gonococcal infection subsequently, at the age of 27, and again about the age of 35. There was no hard sore so far as he knows, and certainly no rash. He had no mercurial treatment internally, though he had black wash applied locally to the penis. He has always been 'nervy', easily excited, and somewhat lacking in self-control. For the last few years he has had some difficulty in walking at times, especially in the dark, and is liable to what he calls attacks of dizziness. In a darkened room he usually likes to be near a table or other ready support in case of need. He has a tight feeling across the upper part of his abdomen, but this he associates with flatulence, because the feeling does not persist when he has brought up some wind from his stomach.

*Objective Examination.*—The patient is explosive in his expressions, and unduly emphasizes each remark. He is emotional, and mentally very quick in all his reactions. The pupils are slightly smaller than the average size; they give a definite reaction to light, but the movement is sluggish, and restricted in range. The co-ordination, tone, and power of all muscles are excellent. The knee-jerks are obtained without re-enforcement. The upper limbs are healthy in all respects. There is some analgesia of the muscles of the legs, and also on pressure over the peroneal nerve at the neck of the fibula. There are no other signs of established disease in the posterior columns of the cord. Joint and muscle sense are excellent. Generative and bladder functions are healthy.

*Case 6.*—C. X., age 55. This member of the family has never suffered from venereal disease. He married at the age of 27, and has a healthy family. Apart from an attack of renal colic about three or four years ago, he has been perfectly healthy. He was carefully examined by me, and I can safely say that his nervous system is absolutely healthy. He is the only member of the family who has escaped venereal infection, and in whom one can definitely exclude tabes.

## SUMMARY.

Of the six surviving members in a family of eight, born of healthy parents, four have acquired undoubted syphilis from various different sources, with a resulting tabes dorsalis in all. A fifth member of the family acquired gonorrhœa (syphilitic infection being doubtful), and probably has early tabes dorsalis. A sixth escaped venereal infection and remains healthy.

It is suggested, in the light of the above facts, that tabes dorsalis cannot be attributed to a special strain of spirochæte introduced at the initial infection, but is much more likely to be due to the spirochæte acting upon tissues specially sensitized, either by natural family peculiarity or by certain methods of treatment.

The discovery of the spirochæte in the tissues (brain and cord) of general paralytics and tabetics should stimulate further research into the other, still unknown, factors which are concerned in the production of these diseases.

## Critical Review.

### THE NEUROPATHIC INDIVIDUAL AS A SOCIAL UNIT.

BY HENRY DEVINE, PORTSMOUTH.

THAT medicine is not only concerned with individual therapy, but has its wider social aspects, is a fact which is obtaining increasing recognition. An infectious patient is isolated, not merely that he may obtain adequate treatment, but also to prevent the spread of the infection to those with whom he comes into contact. Mental disorder may be considered from a somewhat similar standpoint. Every individual by his behaviour exerts some influence upon those with whom he is associated: and this influence is either beneficial or the reverse. If we are to define what is meant by a normal personality, we can only do so in terms of his behaviour or reaction to life. The man is normal whose conduct is in the main creative, helpful to others, and productive of useful social results. In contrast to this, the conduct of the moron, inadequate personality, misfit, crank, and neurotic is ineffective, obstructive, futile, and non-productive. And the results of such ineffectual reactions to life are not confined to the abnormal person, but exert a widespread influence upon the actions, happiness, and mental attitude of others. For this reason much attention is now being paid to the social aspects of psychiatry, and in this review some directions in which this tendency is now finding expression may perhaps be usefully indicated.

In America the psychiatric examination of the army recruits revealed the existence of a surprisingly large number of inadequate personality types who, if they had been retained in the army, would have made a poor adaption and would, of necessity, have been a drag on their units and a constant source of anxiety. It is recognized that these people must be equally inadequate in civil life, and in the main, as social units, unproductive. The relation of these abnormal types to the community is therefore receiving much attention, and the mental hygiene movement has brought the psychiatrist into close contact with the vital social problems of the time, with the result that the literature in regard to social psychiatry is already



voluminous. The campaign for industrial efficiency has led to detailed investigations on unemployment, and such writers as Southard<sup>1</sup> and Adler<sup>2</sup> have shown that many habitually unemployed are of the inadequate, paranoid, or emotionally-unstable types of make-up. These people do not fit in anywhere, they only remain a short time in one place, they inflict much hardship upon their dependents, and are a drag upon the industry during their periods of unemployment.

Then there is the question of 'mental contagion'. It is well known that an unbalanced personality will unfavourably influence other people by the mechanism of 'mass suggestion'. This applies to panics, religious revivals, and strikes. Thus, referring to the psychology of the strike, Lloyd writes<sup>3</sup>: "One idea acting on large masses of men is its distinguishing feature. It is a manifestation of the instinct of the herd, when stampeded, to go in one direction without heed to the dangers incurred or the obstacles to be overcome. It thus becomes an obsession, leading men to clamour for self-aggrandizement while ignorant of economic realities and indifferent to the claims of society at large. . . . It is pathological because it partakes of the nature of a pandemic psychosis. It is a sort of *folie communiquée*—an example of mental contagion on a large scale. There is an underlying paranoid state, a sense of persecution, which leads to acts of resentment and violence." More detailed investigations upon this subject have also been made which support such statements as the above, and it has been shown by Ball<sup>4</sup> that episodes of industrial unrest may sometimes be traced to individuals whom he had previously classified as definitely psychopathic in type.

There is, however, a more subtle and intimate side to this question of mental contagion, viz., the influence which the neuropathic subject exerts upon those with whom he is most intimately associated, that is to say the home circle or family group. A recent paper by Pierre Janet has done much to illuminate this all-important question<sup>5</sup>. In this paper Janet first takes his *psychasthenic group*, and with keen clinical insight analyzes the social characteristics of his patients. He shows that the two fundamental instincts which determine the abnormal social reactions in these cases are the desire to dominate the family and the desire for love and affection.\* Such individuals do not possess the qualities, either strength of character or charm of personality, which entitle them to control others or gain their affection; but they succeed in gaining their ends by means of their neurotic

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\* Do we not see here a possible point of contact between this conception of the neuroses and those of Adler<sup>6</sup> and Freud? The former has formulated a theory of neuroses founded upon the instinct of power—the neurotic uses his symptoms to gain the upper hand—and there are of course the Freudian theories in which the love impulse plays the preponderating rôle.

symptoms (inferior mental operations). They dominate by means of preposterous exactions; give meaningless orders without reference to their utility or value; control, watch, supervise, and interfere with every trivial action of others; treat the family as children; permit no contradictions; establish inflexible and ridiculous rules; resent being left alone; need constant reassurance as to their health; require the constant gratification of every whim. They make incessant demands for love, but give nothing in return. They are often sexually frigid, and their constant demand is to be 'loved for themselves';—that is for inherent qualities which cost them nothing and do not involve any expenditure of psychic energy. They expect and require constant flattery, eulogy, and commendation. They are abulic, incapable of any efficient action, and need constant stimulation and excitement. If thwarted, they lament, threaten, raise objections, exhibit crises of agitation, develop illnesses, faint, moan that they will die, create interminable scenes, tease and annoy, sulk, and make every one feel uncomfortable and in the wrong. Jung has well described the domestic atmosphere in these situations<sup>7</sup>: "Whoever has had a pronounced case of neurosis in his immediate environment knows all that can be 'effected' by a neurosis. In fact there is altogether no better means of tyrannizing over a whole household than by a striking neurosis. Heart attacks, choking fits, convulsions of all kinds, achieve enormous effects that can hardly be surpassed. Picture the fountains of pity let loose, the sublime anxiety of the dear, kind parents, the hurried running to-and-fro of the servants, the incessant sounding of the call to the telephone, the hasty arrival of the physicians, the delicacy of the diagnosis, the detailed examination, the considerable expense; and there, in the midst of all, lies the innocent sufferer, to whom the whole household is even overflowingly grateful, when he has recovered from the 'spasms'."

It is obvious that the atmosphere of a household which includes a case of this kind must be one of intense discomfort, and the situations which arise must be responsible for much domestic unhappiness. And more than this, Janet goes on to demonstrate by numerous clinical examples that the influence of such a case is, as it were, parasitic; the nervous invalid absorbs the psychic energy of other members of the group, who therefore tend to develop various forms of neurosis themselves. He calls this the *neuropathic group*, and states that in his experience an isolated psychasthenic is rare, but that around the case are almost always found others who themselves show evidence of nervous symptoms which are the expression of lowered psychological tension. Janet shows that the explanation of these cases on the lines of heredity is often inadmissible, in so far as there is no blood relationship between the affected individuals. Thus

a bright normal girl may develop a neurosis after her marriage to a man with an obsessional neurosis, or a child with a neuropathic step-father may develop a neurosis when her mother marries a second time and she comes into contact with her new father. Neither does he consider that the occurrence of these cases is explicable on the basis of suggestion and imitation: such a theory, as he shows, being superficial and totally inadequate.

Janet explains the occurrence of these cases by the application of his theory of psychological tension. He develops the view that the social characteristics of these psychasthenics demand an increase of psychic energy on the part of those who are in constant contact with them. Their abulia and indecision render them incapable of doing anything useful, and this involves increased strain and responsibility on the part of the other members of the household. Then their habitual demand for caresses and thanks, their complaints, gloomy and discontented outlook, ingratitude, interference, useless orders, capriciousness, constant criticisms, attacks, scenes, and the like, create a situation which demands an extremely complex and difficult adjustment on the part of those with whom they are associated. Such situations are exceedingly exhausting, they deplete the psychic energy, and may be described as costly to the personality. It is the fatigue of this prolonged effort at adaptation which results in depression and neurosis in other members of the family. It produces a condition of lowered psychological tension of which these nervous symptoms are the expression.

In the light of these observations Janet raises the question as to how far it is justifiable to use the term *mental contagion* in respect to these cases. He points out that if by this term direct suggestion is implied, it would be unsuitable in so far as the neuroses are secondary to the social fatigue which arises from the situation. Since, however, the term serves to emphasize the fact that intimate association with certain persons frequently determines the occurrence of a neurosis in others, and that these persons by their presence and demands profoundly modify the conduct of those in contact with them, he would advocate its use.

Here, then, is a factor in the production of neuroses which would seem to merit more general recognition, especially as Janet, with his unique experience and undoubted authority, states that such 'contagion' occurs with great frequency. Furthermore, its recognition would seem to be of extreme importance, because it prevents an undue emphasis upon inborn, constitutional, and hereditary factors in determination of the neuroses. These cases are psychogenetic in origin; they are the result of circumstances, situations in life, and influences which are capable of removal if their significance is under-

stood. A frank understanding of the situation on the part of all concerned, and rearrangement of the domestic *ménage*, with possibly actual removal of the source of the 'infection' to another atmosphere, will result in recovery, or at any rate will afford an opportunity for a mental readjustment to take place, on the part of the other members of the group. As Janet says, an understanding of these cases will enable the physician to apply isolation as a therapeutic measure with much greater precision than would otherwise be the case. Many of these cases are not regarded as abnormal, either by themselves or by the other members of the family, and the diagnosis has not been 'officially' recognized. It may be said that some of these abnormal types of personality have been left to the analytical novelists to discover.

It cannot be said that the psychological explanation here given by Janet is complete, satisfying, or altogether adequate. It is, in a sense, too mechanical, and it ignores the dynamic and instinctive elements in the psychological situation. It is doubtful if the 'contagious' neuroses—or, indeed, any neuroses—are explicable on the grounds of chronic mental fatigue produced by the mere complexity of the situations to which these individuals are forced to make an adaptation. Such situations as Janet depicts must be profoundly disturbing to the deepest and most fundamental instinctive elements of the personality. Without entering upon any detailed discussion of the subject, must not the psychological explanation be found along the lines of a pent-up libido in which the mechanism of regression comes into play and is responsible for the appearance of the various nervous symptoms? A child with an authoritative, obsessional parent would be thwarted in every direction: there would be no outlet for his libido, interest, psychic energy, or instinctive trends. Every natural and spontaneous impulse would have to be repressed and curbed: there would be no opportunity for self-expression; the whole personality would have to be subservient to the caprice and will of another: the impulse of love and affection would find no normal expression, and unconscious feelings of hatred to the parent would inevitably be created in the mind of the developing child. Such conditions must of course be most unfavourable to the mental health of the child, and, as has been shown in other directions, they are exactly those factors which determine a neurotic reaction to life.

It may be that in the realm of psychopathology at the present time there is a certain degree of chaos: there are various opposing theories and premature generalizations. And it must obviously be so in a subject which has only recently been intensively studied, and which may be approached from so many different angles. The one fact which seems to be gaining confirmation on all sides, however, is

the enormous part taken by the home environment and the parental influence in the development of the mental life of the child and in the determination of his future habits of reaction. There is a growing body of opinion in favour of the view that the more this question is understood, and the more the child is able to grow up in an atmosphere favourable to his mental development, the less is he liable to develop neuropathic traits. This important contribution to social psychology by Pierre Janet should do much to emphasize and confirm these views.

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## Editorial.

### THE LOCALIZATION OF PSYCHIC FUNCTION IN THE BRAIN.

A HUNDRED years ago the attack which science waged upon the surrounding darkness was little more than a raid carried out by a handful of soldiers of fortune who themselves forged the simple weapons of the fight. The battle front has extended since then, and the great engines of warfare have become complex. The adventurers of the past have become the professional army of the present. But the line of battle widens every day, and the soldiers in one brigade scarce know how it fares with their comrades in another.

The lack of co-ordination is particularly evident in the combined attack upon the problem of behaviour which is being made by psychology (as it were, from the air) and physiology (as it were, from the trenches). The information obtained by one seems often to be misinterpreted by the other. To lay our analogy aside, the problem of 'localization of function' in the brain is a case in point of what appears sometimes to amount to misconception.

The older view, that the optic thalamus is the chief 'seat' of sensation and the corpus striatum that of motion, received its death blow on the discovery that motor effects may be evoked by electrical stimulation of parts of the cortex cerebri. It was replaced by the physiological theory of localization of different functions in different parts of the cortex, to which was added the theory of 'subsidiary centres' at different lower 'levels' of the nervous system. Stimulation experiments revealed 'motor' centres in some areas of the cortex. Extirpation of other areas paralyzed general reactions to different forms of stimuli, even although stimulation of these other areas gave no motor reaction. The latter areas were therefore considered to lie further back on the path of conduction between receptive cell and cortical 'motor' area. The nerve fibres of the dorsal ('posterior') spinal roots had been called 'sensory' in the sense that they carried impulses which finally might subserve sensation (but not in the sense that they themselves felt): and in a similar manner these latter cortical areas were also labelled 'sensory'. This older terminology—largely abandoned in the case of the afferent nerves—has still been retained in the case of cerebral centres, in very much the same manner that

the cortical motor region for the lower limb is still called the Rolandic 'leg' area. But the retention of the word 'sensory' has given rise to misconception.

We must not suppose that the *psychic* phenomenon of sensation is localized by the *physiologist* in these so-called sensory regions. All that is claimed is that these different regions or centres form relay stations for nerve impulses derived from particular classes of stimuli: that these nerve impulses are perhaps rearranged there; and that they are transmitted thence to some more common motor mechanism. What is 'localized' is but the path of conduction of nerve impulses which may subserve sensation somehow or other: it is not the point in space at which sensation springs full armed as from the brow of Zeus.

The question whether or not psychic phenomena can accurately be localized at morphological points is insoluble in the present state of our knowledge. Perhaps it is a will o' the wisp, scientifically absurd. We cannot even claim, because two different motor reactions (e.g., speech and gesticulation) may be evoked by the same stimulation, that therefore the seat of the psychic sensation must lie further back in the afferent path than the point of divergence. The possibility that a different individual sensation accompanies each of the different forms of response (although the stimulus is a common one) prevents us from claiming even this.

Head and Holmes<sup>1</sup> have used the 'thalamic syndrome' of Roussy<sup>2</sup> in an ingenious attempt to localize the "centre of consciousness for certain elements of sensation" (such as pain) in the optic thalamus. In one case they obtained a post-mortem examination which showed a lesion of the ventral and lateral regions of one optic thalamus, and this patient had, in life, over-acted to painful stimuli *by speech reactions* (as well as by other motor reactions).<sup>3</sup> These observers suppose that ascending nerve impulses may pass into either (or into both?) of two paths when they arrive at the lateral nucleus of the thalamus. One of these paths is that towards the cortex cerebri; the other path carries them to a hypothetical 'essential organ' of the thalamus itself. They assume that the influence of the cortex upon the thalamus, through the known descending fibres of the former, is inhibitory; and that the over-action in the syndrome is caused by the removal of this inhibition where the lesion interrupts the path between cortex and thalamus.

If this is the case, destructive cortical lesions should also give the 'thalamic over-action' by a similar removal of the inhibition. But Head and Holmes point out that the fact that this does not occur may be due to the possibility that cortical lesions are not usually extensive enough to effect a sufficient reduction of the inhibition. The

fact that cortical lesions do not produce an effect upon sensibility to pain is used by them to support their theory that pain sensibility is not a function of the cortex, although it might of course be explained in a similar manner.

The importance of this well-known attempt to localize a psychic function in a subcortical region lies in the fact that the beauty and suggestiveness of the idea appear to be leading to its acceptance by psychologists as an ascertained fact. But the hypothesis is open to challenge.

We may leave aside the assumptions that the descending influence of the cortex upon the thalamus is one of depression, and of depression only, and that sensibility to pain is not affected by a lesion of the cortex however large it be. There remains the fundamental obstacle that the patient in question was able to over-act by *speech*.

If the thalamus itself takes part in the mechanism of the over-action, *it must therefore still be in connexion with the speech mechanism*. This fact forces us to one of two conclusions. Either the motor speech mechanism lies in the thalamus, and the thalamus in that case itself 'said' that it over-acted; or that mechanism lies in the cerebral cortex (or in some other region of the cerebrum than the thalamus)—in which case the 'essential organ' of the thalamus turns out to be merely a portion of, or a relay station in, the path between receptor and motor speech mechanism. In this latter case the site of the over-action *may* be in the thalamus (if the lesion removes an inhibitory influence of cortex upon *thalamus*); or it *may* be in the cerebral cortex (if the inhibitory influence removed is one of thalamus upon *cortex*).

Our knowledge of the physiological rôle of the thalamus in this over-action is therefore still indefinite. But even if we were able accurately to localize the site of the over-action, we should still be as far as ever from localization of the 'site of consciousness' for affective sensations. We may just as legitimately suppose it to be in the speech mechanism (or other motor mechanism) as in any preceding part of the path of conduction. We must return to our original thesis that we cannot at present localize psychic phenomena. All that we can say is this: *To judge from the characteristics of motor end-reactions, psychic phenomena may possibly accompany physiological activities which occur in certain (or in all) nervous paths of conduction.*

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## Abstracts.

### Neurology.

#### NEURO-ANATOMY AND NEUROPHYSIOLOGY.

- [105] On deep localization in the cerebral cortex.—E. G. VAN'T HOOG.  
*Jour. Nerv. and Ment. Dis.*, 1920, li, 313.

THE author points out the danger of forgetting the general integration of the functions of the body in paying too much attention to the specific functions of various organs or parts of organs. The cerebral cortex is more differentiated than any other organ, and yet by virtue of the correlative function essentially a unit in itself. Much attention has been given to superficial localization of the cortex which divides it up into functionally differing regions and areas, but not so much to the deep localization, i.e., to determining the functions of the various layers of cortex perpendicular to the surface of the brain.

In 1884 Meynert described six morphologically distinct layers of the cortex, which, with the help of the investigations of a number of workers into the comparative anatomy of the nervous system, can be studied phylogenetically. In 1909 Kappers concluded that, excluding the superficial layer of fibres, the neocortex may be divided into two functionally distinct layers: (a) an outer supragranular layer (laminae 2 and 3) predominantly associative, receptive, and sensitive, and (b) an inner infragranular layer (laminae 5 and 6) predominantly corticofugal and commissural. Between the two is the granular layer (lamina 4), which Kappers considers is receptive and associative within the hemisphere and may also serve as matrix to lamina 3.

Nieuwenhuijse describes the cortex as an organ consisting of at least two organic parts relatively independent of one another, a peripheral part consisting of the four outer laminae, and an inner part consisting of the two inner laminae. Bielschowsky, in 1917, came to the same conclusion as Kappers in respect of deep localization from his studies of two cases of cerebral hemiplegia.

Dubois, on mathematical grounds, emphasized the fact that the receptor functions in larger animals increase more than effector functions, and therefore in light of the foregoing arguments an increase in the supragranular layers might be expected in them, which is precisely what the author has found in an investigation of the cortex. In the larger animals there was a constant decrease in the extent of the granular layer, giving the impression that the increase in height of the supragranular layers occurs at the expense of the granular layer. He concludes that the granular

cells should be considered as matrix cells capable of giving rise to any sort of differentiated cell.

The author summarizes the results of his investigations as follows: (1) The supragranular cortex layers are recepto-associative: (2) The functional nature of the granules is also receptive and associative in the post-central region: (3) The granular cells should be conceived of as matrix cells not only in the fascia dentata, but also in the neocortex. It is surprising no reference is made in this paper to the work of Shaw Bolton in England.

R. G. GORDON.

[106] Combined voluntary movements (Mouvements volontaires d'ensemble).—NORCA. *L'Encéphale*, 1920, xv, 390.

In the newly-born we notice movements of all the limbs of such a varied nature that we cannot understand either their sense or their utility. The more the infant is excited the more he moves his limbs, and this disorganized agitation is doubtless his way of expressing his disapproval. It is not until the infant is four months old that he will make any attempt to use his hands to draw the nipple into his mouth, and this may be considered as the first real voluntary movement. If we ask a young child to shut one of his hands he immediately obeys the order, but very often we see that at the same time he will flex his wrist, turn his arm into the position of semi-pronation, flex the elbow, and adduct the whole of his upper limb so as to pass it across the trunk. If we then ask him to open his hand he does so, but at the same time he extends his elbow, opens out his fist, and moves the whole upper limb into the former attitude of repose. Later, when the child is bigger, he will shut the hand by itself without flexing the other articulations: but even then if one tells him to close his fist very hard he will flex his wrist and elbow, etc., especially if he is not particularly intelligent, or is not paying attention to the order given. In the adult these subsidiary movements of the wrist, and of the limb as a whole, can be noticed if he is asked to perform the actions against resistance. In the same way with the lower limb: when a young infant is lying in bed and is asked to dorsiflex his foot, he will at the same time flex the corresponding knee. The adult will do the same thing when the movement is performed against resistance. This phenomenon forms the basis of Strümpell's sign. It is thus evident that the tendency to combined movements which exists in the infant may persist under certain circumstances in the adult. These facts apply equally to the face. When a child, or an adult possessing low intelligence, is asked to shut his eye, all the muscles of the face are put in action at once, and the same is true of intelligent adults when asked not only to shut their eye but to screw it up. It would seem that the child is born with a tendency to make symmetrical and identical movements with the eyes, the face, the limbs, the trunk, and the abdomen, and it is only by exercises and education of his movements that he comes to confine these to one side of his body. The child at first performs unilateral movements so as to involve all the muscles of the limb, and the same phenomenon is met with in certain adult hemiplegics.



In not too severe lesions of the pyramidal tract, the combined movements described above as occurring in the infant are met with, and the author describes a case in detail exemplifying this. He thinks that this is explained by the fact that in order to close the hand it is natural to flex the elbow at the same time, since the flexor muscles are inserted on one side in the epitrochlea and on the other side on the phalanges. This arrangement explains the flexion of the two segments at the same time, but the reason that the normal adult can shut his hand without movement of the elbow is that he has the power to extend the elbow voluntarily, and so keeps it in this position while he closes his hand. If, however, he has lost the power of extending the elbow, as is the case in hemiplegia, it is easy to understand why he must close his hand and flex his elbow at the same time, and this will be equally true when the power of extending the elbow is not completely lost but only weakened. The same explanation serves to show why he closes his hand when asked to flex his elbow. All these movements can only be observed in the case of those hemiplegics who have kept a certain degree of voluntary movement.

The conclusions drawn by the author are that combined movements are an economy of force, while dissociation of these movements demands a greater exertion, and that is why the former type of movements are found in the infant, since the pyramidal tract is not yet developed and consequently all voluntary movements are feeble. This also happens in the case of the adult who has a lesion of his pyramidal tract. It is more easy for him to make combined movements than to dissociate them.

R. G. GORDON.

- [107] Remarks on the normal and pathological histology of the caudate and lenticular nuclei (Einige Bemerkungen zur normalen und pathologischen Histologie des Schweif- und Linsenkerns).—BIELSCHOWSKY. *Jour. f. Psychol. u. Neurol.*, 1919, xxv, 1.

IN view of the increasing importance of the group of diseases associated with changes in the corpus striatum, it is essential to have an authoritative account of the normal histology of these masses of basal grey matter. By Nissl's method two types of cell are found in the putamen and caudate, viz.: (1) Small star-shaped, spindle-form, or triangular cells, with numerous short and slender dendrites, and with axons which divide up in relatively close proximity to the cell-body; the latter is pale and without Nissl's granules. To this group belong the majority of the cells. (2) Larger polygonal cells, more or less rounded, with chromatophil substance in the cytoplasm and with achromatic material that stains moderately deeply. Their axons break up at some distance from the cell, indicative of synergic or associative function. These larger cells often contain yellow pigment even in young subjects, and under normal conditions are nevertheless frequently surrounded by satellite glial cells, which must not be taken to indicate neuronophagia. They are evidently very labile structures, and any long illness or ante-mortem cachexia is calculated to produce a necrobiosis which must not be misinterpreted. In the globus pallidus is only one type of cell, large and with unusually long dendritic processes, and both

the cell-body and these dendrites are often covered with delicate 'Endkörperchen', thickly set, almost forming a covering to the cell. Bielschowsky furnishes further histological details for which the original must be consulted.

From his studies he concludes that the globus pallidus is a reflex organ of a primitive sort, with centrifugal connection to the ventral part of the thalamus, regio subthalamica, and corpus Luysii. Physiologically it is under the control of the putamen-caudate, and the ganglion as a whole resembles the cerebral cortex in being a highly differentiated terminal-grey matter (Endgran). The afferent-efferent functioning of the globus pallidus is controlled by the putamen, which, with the caudate, may therefore be regarded as a regulating and inhibiting centre for extrapyramidal motility.

S. A. K. W.

- [108] **A further contribution on the function of the cerebellum** (Weiterer Beitrag zur Function des Kleinhirn).—JELGERSMA. *Jour. f. Psychol. u. Neurol.* 1919, xxv, 12.

THE following are some of the author's conclusions:—

The cerebellum is subordinate to the cerebrum in the sense that centripetal impulses underlying equilibrium and muscle sense pass through the former on their way to the latter, while the co-ordinating paths of cerebral origin pass through the cerebellum to the periphery.

The cerebro-cerebellar co-ordination system is made up of a centripetal path from the cerebellum via the superior cerebellar peduncles and optic thalamus to the cortex, probably to frontal and temporal lobes, by which path muscle-sense and equilibrium stimuli are conveyed to the cerebrum and there 'changed into movement-images'; these produce a co-ordinating action by the crus, pons, and cerebellum, and so to the periphery.

Muscle-sense movement-images are located in the frontal lobe, and those connected with equilibrium in the temporal lobe; lesions of these parts may give rise to inco-ordination in either function; hence cerebellar symptoms may be produced by purely cerebral lesions.

Impulses concerned with deep sensibility or with equilibrium are unconscious; they reach the Purkinje cells from the periphery and are thence transferred to the cerebral cortex; it is not known whether they are separable in the former, but they are separately located in the latter.

The peculiar position of the Purkinje cells renders a quick, reflex co-ordination of movements possible: in such rapid, reflex co-ordination the cerebrum plays no part, but it can and does in 'higher' co-ordination of a voluntary kind.

The cerebellum is a pure projection—and not association—organ. Impulses are always passing through it to and from the periphery; hence it contains very little white matter relatively because it has no association-fibres.

Cerebellar atrophy best shows the cerebellar syndrome; but it may be largely compensated for by the cerebrum; hence cerebellar defects, when they occur, are seen at a maximum in imbeciles.

S. A. K. W.

- [109] The so-called reflex automatisms of the spinal cord (Studien über die sogenannten Reflexautomatismen des Rückenmarks). -- OTTO MARBURG. *Jahrb. f. Psychiat. u. Neurol.* 1920, xl, 99.

THE term reflex should only be applied to movements which follow an external stimulus without the intervention of consciousness, when the movement occurs in the part to which the stimulus is applied, when the afferent and efferent impulses traverse one reflex arc alone, and when the movement is confined to one joint. For those complex movements which have been called *réflexes de défense* and *réflexes d'automatisme médullaire*, the author proposes the name 'reaction' (Reakt). In contrast with the reflexes, the features of the reactions are that several joints are moved, the impulses traverse more than one reflex arc, and the movements are not confined to the part stimulated.

As the reactions are seen when the functions of the pyramidal tract are in abeyance, Marburg decided to investigate them in newly-born infants, in whom these tracts are still unmyelinated and functionless. His findings can be summarized as follows: A sharp prick on the sole causes a fan-like spreading of the toes with abduction of the hallux, dorsiflexion of the foot, and flexion of the knee and hip. A lighter stimulus, such as gentle percussion of the outer border of the foot or stroking the sole, produces plantar flexion of the toes only. Dorsiflexion of the hallux does not occur as a rule until several vigorous stimuli have been applied to the sole, but it is obtained at once by compressing the calf or stroking the tibia firmly. These responses persist during the first week of life. At the eighth week dorsiflexion of the hallux is the only movement obtained—plantar flexion never occurs. The limb is withdrawn at the same time, but it is difficult to decide whether the movement is voluntary or reflex. Infants at the intervening ages were not examined.

These reactions in the newly-born are found to correspond with some of the phenomena seen in adults, e.g., Babinski's sign and the reflexes of Rossolimo and Mendel-Beehterew. The reason why the same lesion should produce now one of these reflexes and now another cannot be given. In the newly-born it depends on the intensity of the stimulus; in adults the deciding factor has escaped detection.

After discussing the status of Babinski's sign at length, the author concludes that although it is often part of a 'reaction', it may occur as an isolated sign. He also considers that the 'reactions' are of little importance and unworthy of the attention that has been given to them in certain quarters. With these opinions most readers in this country will not agree. Recent work has shown that Babinski's sign is never an isolated phenomenon, but is essentially a part of one of the 'reactions' which Marburg describes, namely, the flexion-reflex of the lower limb. The significance of the 'reactions' as indices of the severity and progressive nature of lesions in the cord, and their importance for a proper understanding of the abnormal attitudes assumed by the lower limbs in disease, do not seem to be appreciated by the writer of this paper.

W. J. ADIE.

- [110] **Peripheral nerve topography.**—W. M. KRAUS AND S. D. INGHAM. *Arch. of Neurol. and Psychiat.*, 1920, iv, 259.

A KNOWLEDGE of the functions of the various fasciculi that make up a nerve is of considerable importance to the surgeon, who has often to deal with incomplete war injuries of peripheral nerves. Marie and his co-workers were the first to employ electrical stimulation with the object of defining the motor localizations within nerves. The investigation undertaken by Kraus and Ingham was a continuation of that work, and had the same object in view, namely, to determine, by the application of a faradic current to the circumference of a nerve, the location and function of the fasciculi that lie beneath. It was found as a general rule that stimulation of the proximal part of a nerve did not cause contraction of the muscles supplied by its distal portion, the explanation probably being that contraction of the more powerful proximal muscles masks the actions of the smaller hand and foot muscles. A review of the results of electrical stimulation for a given muscle at various levels brought out one point of importance—the course of motor fasciculi is a straight one from the point where the nerve has been made up by its contributing segments to the point of offset of the fasciculi as a branch.

The greater part of the paper, which does not lend itself to abstracting, is devoted to a careful record of the findings in individual nerves and their branches, and is illustrated by a large number of diagrams.

R. M. S.

- [111] **The motofacient and non-motofacient cycles in elevation of the humerus.**—B. STOOKEY. *Arch. of Neurol. and Psychiat.*, 1920, iv, 323.

THE generally accepted view that, in raising the humerus to the vertical, the deltoid elevates the arm approximately to a right angle, and thereafter scapular rotation completes the elevation, is rejected by Stookey, who studied a series of röntgenograms taken of himself under constant conditions. He divides the mechanism of elevation of the arm into three physiological cycles in which the deltoid and supraspinatus are alternately motofacient and non-motofacient.

The first cycle of elevation is accomplished by the action of the deltoid and supraspinatus, raising the humerus to about  $60^\circ$ , and accompanied by slight rotation of the scapula; the second cycle is accomplished principally by rotation of the scapula, due to the action of the serratus magnus, trapezius, rhomboidei, and levator anguli scapulae, which raises the arm to approximately  $115^\circ$ , and is accompanied by slight elevation of the humerus; the third cycle is accomplished by elevation of the humerus from  $115^\circ$  to  $178^\circ$ , and is due to the action of the deltoid and supraspinatus, there being only slight rotation of the scapula. The deltoid, therefore, raises the arm both in the initial and final stages of elevation: in the latter the coracobrachialis and the clavicular head of the pectoralis major assist. Phylogenetically the clavicular head of the pectoralis major is present only as such in the higher forms, particularly in the chimpanzee and gibbon. It may

be considered as a migration of the innermost muscular fibres of the clavicular head of the deltoid. Hence it is not surprising that this muscle should resume its former association in function, and assist in elevation of the humerus from above  $115^{\circ}$ .

R. M. S.

[112] The relation of the cerebral hemispheres to arterial blood-pressure and body-temperature regulation: preliminary note.

—F. T. ROGERS. *Arch. of Neurol. and Psychiat.*, 1920, iv, 148.

Loss of ability to maintain a normal body-temperature after extensive traumatic injury around the third ventricle is common to all warm-blooded animals from man to birds. Few animals will long survive such an operation: in the dog one week is the maximum recorded length of life: but in birds, with proper precautions, the animal may be kept alive for several months.

In an attempt to analyze the factors that lead to this loss of ability to regulate body-temperature, studies were made on the circulation of the blood in these animals.

It was found that removal of the cerebral hemispheres in the pigeon, leaving the thalamus intact and body-temperature normal, leads to a constant fall in arterial pressure of from 10 to 20 per cent. This fall comes on immediately, and persists for as long as seventy-five days after the operation. Removal of the hemispheres and thalamus leads to a loss of temperature regulation, and usually to a slightly greater fall in arterial pressure than does loss of the hemispheres alone. The poikilothermous condition that follows deep lesions of the brain-stem is not due to changes in the arterial blood-pressure alone.

R. M. S.

### NEUROPATHOLOGY.

[113] Spontaneous coagulation en masse of the cerebrospinal fluid (La coagulation massive et spontanée du liquide céphalo-rachidien).

—LANTUÉJOL. *Revue neurol.*, 1920, xxvii, 339.

A COMPLETE review of this syndrome (Froin's syndrome) and its causes, with full bibliography. The phenomenon must be regarded as a rarity, the author having been able to collect from the literature only thirty-eight cases in which coagulation was really spontaneous and complete. The clinical facts are as follows. Lumbar puncture performed at the usual site yields a fluid which is always clear, but almost constantly of a golden-yellow colour. The pressure is usually less than normal, and the fluid may be viscous. In a certain number of cases the amount obtainable is exceedingly small, which may be due to one of two causes: the needle may have entered a sac full of fluid shut off from the general subarachnoid space, or the flow may have been obstructed by spontaneous coagulation within the lumen of the needle. More often coagulation does not take place for ten to fifteen minutes, sometimes only after several hours. The clot is as a rule so complete that the test-tube may be inverted without spilling it. After a while it contracts, with exudation of golden-coloured serum.



Coagulation in the cerebrospinal fluid must depend upon the same factors as coagulation in the blood—the presence of thrombokinase, thrombogen, fibrinogen, and calcium salts. As with blood, the precipitation of these salts with potassium oxalate prevents coagulation. Fibrin is absent from normal cerebrospinal fluid, but is found in the form of a fine reticulum in cases of acute meningitis. In the syndrome under consideration it may be present in quantities approaching or exceeding those found in blood. The presence of fibrin in the fluid is accompanied by an excess of albumin. While the normal quantity of this substance is 0.13 to 0.30 grms. per litre, the amounts recorded in cases of coagulation *en masse* vary from 4.17 grms. to 42.05 grms. per litre. These figures far exceed those observed in chronic or acute inflammation of the central nervous system: in dementia paralytica the albumin content never exceeds 2 or 3 grms. per litre, and in cerebrospinal meningitis it is usually about 3 grms., though it may be as high as 6 to 8 grms., and in an exceptional case of pneumococcal infection has reached 11.6 grms. In the syndrome under review the increase in fibrin content is usually parallel with that of the albumin.

The golden colour (xanthochromia) in these fluids is due to the presence of hæmoglobin or its derivatives. The other abnormalities have not been sufficiently studied, but the presence of albumose has been determined in several cases.

While the chemical examination of the fluid in these cases shows constant abnormalities, cytological and bacteriological findings are variable, depending, it appears, on the pathological cause, which is itself variable. Syphilis, neoplasms, spinal caries, tuberculous or meningococcal meningitis, and trauma have been recorded as producing the syndrome.

The meningitides give rise to their specific cell reactions: a lymphocytosis is found in cases due to syphilis, but in the majority of cases there is no increase in the cell-count. In one case, however, due to sarcoma of the meninges, there was an abundant lymphocytosis. There are generally a few red cells present. The cell content, therefore, is an aid to diagnosis of the cause of the syndrome, not an indication of its presence.

On the clinical side, it is remarkable that most of the cases recorded have been of flaccid paraplegia.

The practice of performing serial punctures at various heights has shown that in these cases a level can be determined above which the fluid is normal, while below it shows the coagulation syndrome, thus proving the existence of a block in the subarachnoid space. In two cases the fluid first obtained has been of the nature described in this syndrome, but, as the flow continued, has become more and more normal, as if the subarachnoid block had become permeable as the result of lumbar puncture.

The prognosis of life in these cases depends of course upon the pathological cause, but would appear to be generally grave, even in cases due to syphilis and spinal caries.

After the presence of coagulation *en masse* has been proved, a second puncture performed a few days later may yield a normal fluid, or one nearer normal than the first: if, however, a sufficient time be allowed to elapse,

the original character reappears. It would appear that the fluid is not originally secreted in the dense state, but becomes progressively richer in fibrin and albumin with stagnation. In the fluid obtained from punctures at short intervals in a typical case, there is as a rule a yellow colour, and some excess of albumin, but coagulation occurs only on the addition of a drop of serum. These facts are of interest in establishing the existence of 'formes frustes' of the syndrome, which may precede the appearance of the complete phenomenon, or appear as stages in its regression.

In nine cases autopsies have permitted correlation of clinical with pathological data, and to these may be added two in which an incomplete Froin's syndrome was present. In every case there has been shown to exist a complete block of the subarachnoid space, either from compression or meningeal constriction, with the resultant transformation of the lower thecal cul-de-sac into a closed cavity. It is this which is the essential pathological cause of Froin's syndrome. Vascular lesions also have been almost constantly present in the form of microscopical hemorrhages, peri-arteritis, and hyaline degeneration. The vessels below the level of the lesion have been congested. Transudation and hemorrhage from these into the closed sac produce its fluid content, golden in colour, containing fibrin and excess of albumin. The density of this tends to increase, since the normal channels for its absorption are cut off by the block. The fluid thus formed is in reality more comparable with that of a pleural effusion than with normal cerebrospinal fluid.

A single observation confirmed by autopsy in which the Froin syndrome was associated with no symptoms of paraplegia, shows the possibility of complete occlusion of the subarachnoid space without compression of the cord: in this case it was due to oedema of, and fibrinous adhesions between, the meninges. This is the most probable explanation of the occurrence of the syndrome as the result of an acute meningitis.

Repeated lumbar punctures appear to have some therapeutic value, being followed by amelioration of symptoms, and are devoid of risk. Therapeutic injections may be made above or below the lesion, according to the object aimed at, but the danger of local damage to the cord and its roots must be borne in mind when drugs are injected into the closed sac, from which the possibility of absorption is extremely limited. If surgical intervention is indicated, serial punctures at different levels are the most accurate guide to the level of the lesion. Finally, antisyphilitic treatment should be carried out whenever the pathological cause is doubtful.

C. P. SYMONDS.

## VEGETATIVE NEUROLOGY AND ENDOCRINOLOGY.

[114] The rôle of the pituitary gland in epilepsy.—B. R. TUCKER.  
*Arch. of Neurol. and Psychiat.*, 1919, ii, 192.

TUCKER considers that convulsions, whether periodical and termed epilepsy or not, are due to definite pathological cerebral-tissue changes, which may be congenital or induced, and hence that epilepsy is an organic

and not a functional condition. Among the various underlying causes of convulsions he recognizes certain conditions of the pituitary gland causing a change in its secretion.

Cushing believes that the secretion of the posterior lobe is poured into the cerebrospinal fluid, and bathes the cortex with a substance necessary for the stability of the cortical cells. If the secretion is diminished, the cells may be said to deteriorate, and the administration of pituitary extract tends to alleviate symptoms caused by undersecretion of the gland.

Two types of hypopituitarism are described—chronic or congenital, and transitional. Convulsions, usually beginning during adolescence, may occur in either type. X-ray examination shows that in the chronic or congenital cases of hypopituitarism the size of the fossa is diminished, while in the transitional type it is enlarged.

In a series of 200 cases of epilepsy, 31.5 per cent revealed evidence of pituitary disturbance. Treatment by pituitary-gland feeding had a markedly beneficial effect, and in some cases led apparently to a cure.

The results of pituitary feeding are shown in two tables, and three plates illustrate the morbid appearances of the pituitary fossa.

R. M. S.

[115] Hypophyseal disorders with special reference to Froehlich's syndrome (*dystrophia adiposogenitalis*).—H. G. BECK, *Endocrinology*, 1920, iv, 185.

A GENERAL and readable summary of our knowledge concerning conditions characterized by abnormal obesity resulting from disorders of the hypophysis.

Reference is made to a case, corresponding to Froehlich's (1901) original description, published by Moll in 1840, of a woman of 47 in whom visual disturbances and the rapid development of obesity were associated with a sarcomatous tumour of the pituitary.

The main features of *dystrophia adiposogenitalis* are enumerated. The distribution of fat is abnormal and characteristic—viz., in the region of the hips, upper thighs, lower abdomen, mons veneris, retroperitoneal space, and omentum. The skin is white, like alabaster, the hands and feet are small, the fingers tapering, and the crescents of the nails often absent. If the condition originates before puberty, the stature remains small and sexual development is delayed, with a tendency to reversion to the opposite sex; if in adult life there are retrogressive changes in the sexual organs, with a similar tendency to reversion. The basal metabolic rate is 15 to 25 per cent below normal, polyuria may be present, and in rare cases true diabetes insipidus develops, probably as the result of an extension of the lesion into the tuber cinereum and neighbouring parts of the brain. Finally a condition of hypophyseal cachexia may result.

To anterior-lobe deficiency the author attributes (1) disturbance of growth, (2) obesity, (3) genital hypoplasia, (4) temperature anomalies, (5) cachexia; while to deficiency of posterior-lobe secretion are ascribed (1) hypotension, (2) increased sugar tolerance, (3) diminution of basal metabolism.

From the circumstance that the thyroid, through its effect on the autonomic system, increases metabolism and stimulates pituitary function, thyroid extract ( $\frac{1}{2}$  to 1 gr. t.d.s.) is recommended in these and similar cases, combined with anterior-lobe extract (Parke Davis— $2\frac{1}{2}$  gr. t.d.s.). Under treatment the general condition improves and a redistribution of fat often occurs without loss of weight. For the polyuria, 1 c.c. infundibulin hypodermically on alternate days provides an infallible but transient remedy, while for headache whole-gland extract ( $\frac{1}{2}$  to 2 gr. twice a day) is recommended.

J. L. BIRLEY.

- [116] **The oculocardiac and the vagosympathetic reflexes: their clinical significance** (Les réflexes oculocardiaques et les réflexes vagosympathétiques; que peut-on attendre d'eux en clinique?).—A. C. GUILLAUME. *Presse méd.*, 1920, xxviii, 574.

PHYSIOLOGICALLY, the exercise of firm and increasing pressure on the globe of the eye leads to certain reflex effects, of which the most conspicuous is a slowing of the pulse some ten or twelve beats per minute (oculocardiac reflex). Accompanying this there is also a slowing and deepening of respiration (oculorespiratory reflex) and an alteration of blood-pressure, which, however, is somewhat inconstant. Other less frequent reflex results are pilomotor, oculomotor, and alterations in the secretion of urine (polyuria, glycosuria).

Under pathological conditions the oculocardiac reflex may become: (a) Extremely exaggerated, so that when pressure is exerted on the eye of the patient the pulse-rate may be reduced to half and even abolished altogether for a few seconds; (b) Inverted, the pulse-rate being increased, together with the respiration-rate; (c) Abolished, there being no response evoked by prolonged pressure on the eye-ball.

The reflex consists of an afferent neurone in the 5th nerve and an efferent in the vagosympathetic. The sensory stimulus reaching the central nervous system (medulla) provokes a motor response which is normally an excitation of the vagosympathetic (or parasympathetic). In pathological states this response may be exaggerated, diminished, or absent. In any case in which it is subnormal, it may be overbalanced by the reaction from the sympathetic proper (which, it will be remembered, produces an opposite effect to that of the parasympathetic). In common with all reflexes, the oculocardiac reflex is in addition dependent on the integrity of its motor and sensory neurones. Any lesion involving its reflex path may lead to irritation or diminution of the reflex phenomena. Thus conditions causing increase or decrease in the normal degree of vagotonia, and lesions involving the floor of the 4th ventricle, must be recognized as leading to modifications of the reflex. On the other hand, certain cases of tabes not infrequently exhibit the normal response if the pathological changes are confined to the spinal cord, the medulla-itself being largely uninvolved.

The author proceeds to point out that the response in the oculocardiac reflex is not confined to stimulation of the trigeminal nerve. It can be obtained to a less degree as the result of any marked sensory stimulus, and

is in reality the direct response of the parasympathetic to stimulation. The whole phenomenon should preferably be recognized as the *sensitivo-organo-vegetative reflex*, always remembering that the oculocardiac reflex is, of all the numerous types, the most easily investigated. The pituitary gland deserves especially to be mentioned, owing to the marked degree of the reflex response produced by its stimulation. Other types are cilio-spinal, vesical, rectal, perineoscerotal. Investigation of these distinct types of the sensitivo-organo-vegetative reflex is a means to be employed by the physician in his attempt to explore the as yet ill-understood vegetative nervous system.

W. JOHNSON.

- [117] A rare case of cerebrospinal syphilis with disease of the pituitary body (Ueber einen seltenen Fall von Laues des Zentralnervensystems, combinirt mit einer Erkrankung der Hypophyse).—H. JOSEPHY. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lviii, 56.

A WOMAN of 53 died of an illness lasting six months which was diagnosed first as tabes, then as general paralysis, and just before her death as pseudobulbar palsy or doubtful cerebral syphilis. The findings after death were generalized syphilitic leptomeningitis, several large gummata in the right parietal lobe, and numerous miliary gummata scattered throughout the cerebellum, brain-stem, and spinal cord. In one section through the pons fifty gummata were seen. Many cases of miliary gummata in the brains of general paralytics have been described in recent years, but so far as Josephy can ascertain this is the first case in which this change has been found in a brain in which evidence of general paralysis was entirely absent.

In addition, the pituitary body showed unusual lesions, the most remarkable being an increase in the epithelial elements, numerous giant cells, and areas of necrosis.

Simmonds, who examined 2000 pituitary bodies, found four cases of this kind, all in women over 50. He considered that the lesions had nothing to do with syphilis or tuberculosis, but were changes *sui generis*. Josephy thinks the changes in his case represent a peculiar histological form of syphilis.

W. J. ADIE.

- [118] Exophthalmic goitre with bulbar myasthenia.—G. E. RENNIE. *Med. Jour. of Australia*, 1919, vi.

THERE have been recorded a few instances of this curious association, and the prognosis has hitherto been considered as hopeless. Yet the author quotes the case of a man who at the end of a year of bulbar myasthenia with exophthalmic goitre began to improve, and was subsequently able to withstand a bad attack of typhoid fever, and then to resume his work, with no trace of muscular weakness. He was seen again twelve years after, and seemed absolutely cured, except for a slight paresis of some of the ocular muscles. It is noteworthy that the cardiac musculature, notwithstanding the co-existent Graves' disease, was entirely spared.

J. E. NICOLE.



## SENSORIMOTOR NEUROLOGY.

[119] The epidemiology of encephalitis lethargica, and its different forms (*Considérations sur l'épidémiologie de l'encéphalite léthargique et sur ses différentes formes*).—C. Economo. *Arch. Suisses Neurol. et Psychiat.*, 1920. vi, 274.

THE first epidemic of encephalitis lethargica, in Vienna, was that of the winter of 1916-17. In March, 1917, in collaboration with Wiesner, the author succeeded in transmitting the disease to a monkey, which developed all the characteristic symptoms, by subdural injections of an infusion of the brain of a patient dying from encephalitis lethargica. As a result of subsequent experiments on monkeys the same observers were able to establish definitely that the virus is not identical with that of poliomyelitis, since the latter can pass a Berkefeld filter, but not the former. In the first epidemic Spanish influenza had not made its appearance, and the most careful search failed to disclose Pfeiffer's bacillus. Previous outbreaks of the same disease had undoubtedly occurred, and had been mentioned in the literature under different names, the most noteworthy being one in the north of Italy after the epidemic of influenza of 1890, described under the name of 'nona'.

The variations in symptomatology noticed in the disease described as encephalitis lethargica may be explained by the difference of localization of the virus in the central nervous system. In the first epidemic the majority of cases presented the following clinical picture. A preliminary malaise of the influenza type was followed by symptoms suggesting meningitis, with paralysis of the external muscles of the eye, the internal muscles being seldom affected. The other cranial nerves were rarely affected, and bulbar symptoms were very uncommon; somnolence, though not constant, was frequent, and delirium occurred in many cases. Fever was frequently completely absent, but in other cases it was very persistent, while at other times it showed complete irregularity. Mild paresis and alterations of the reflexes were common occurrences in several cases, but choreiform movements were seldom seen. The duration of the illness varied from some days to months, and the mortality was about 50 per cent. Post mortem, a true inflammation was found involving the grey matter, particularly in the neighbourhood of the ventricles, the infundibulum, and the aqueduct, part of the floor of the third ventricle also being often involved, while the basal ganglia were affected to a less degree. In practically all cases the cerebral cortex was slightly inflamed. In most cases the grey matter of the cord was involved very slightly, more particularly the posterior and anterior horns. There was a mild meningeal infiltration, and consequently a slight but constant cellular increase in the cerebrospinal fluid.

At the beginning of 1918 Breinl published an account of a similar epidemic in Australia. In these cases the illness started with fever and convulsions, passing after two or three days into lethargy. The majority of the patients died with symptoms of bulbar paralysis. Sometimes tremor and nystagmus were noticed, and the reflexes were increased or

diminished. Pathologically the disease showed itself as a polio-encephalitis with infiltration and neuronophagy, the spinal cord being more markedly attacked than in the epidemic above mentioned. Breinl thought it was a peculiar form of poliomyelitis, but it was most probably an atypical epidemic of encephalitis lethargica.

The English epidemic of 1918 was distinguished from the first epidemic by the frequent appearance of stuporose states, by the fact that a number of cases resembled Parkinson's disease, and by the involvement of the internal ocular muscles with alterations of pupillary reflexes, accommodation being affected while the reflex to light remained unaltered. The epidemic of 1918 in France described by Netter appeared to be very similar to that of the first epidemic in Austria, but the French cases as a rule showed no sign of meningeal symptoms. As a corollary to this the Austrian cases showed post mortem a slight infiltration of the meninges, and the cerebrospinal fluid gave a slightly positive globulin reaction and increase in cells. The French observers almost universally declared that the fluid was normal. Furthermore, fever was a more characteristic feature of the French epidemic, and vied in diagnostic importance with the ophthalmoplegia and lethargy. In the Austrian epidemic fever was a much less constant symptom. In the French epidemic, as in the English, the similarity to Parkinson's disease was noticed.

Encephalitis lethargica made its appearance in Germany in the winter of 1918. In this group of cases meningeal symptoms were almost always absent and the cerebrospinal fluid was generally normal, initial excitation with severe choreiform movements being followed by typical ophthalmoplegia and lethargy. Naef, at Munich, described some cases resembling *tabes dorsalis*, with pupillary changes, hypotonia, and absence of tendon reflexes. Other cases often resembled Parkinson's disease.

Except for a few isolated cases Italy had been spared the disease since the epidemic of 'nona' in 1890, when suddenly during the winter 1919-20 a violent epidemic broke out in the north. Vague rheumatic pains were the first signs of illness, followed by a short delirious period, which gave place to a state of insomnia; then myoclonic convulsions occurred, especially in the abdominal muscles, often on one side only, and later in other muscles. Frequently also choreiform movements were met with. At the same time neuralgic pains were complained of, with tenderness over the nerve-trunks. A phase of paralysis developed after this state of excitement, particularly of the ocular muscles, and also all those supplied by other cerebral nerves, and finally lethargy ensued. Sometimes an illness was commenced by pharyngitis, fever, and herpes labialis. A state of profound prostration followed which gave the impression of a serious toxæmia. Besides delirium other mental symptoms were frequent, especially states of hypomanic excitation. The mortality was 30 per cent.

In January, 1920, a strong south wind raged across the whole of Austria for several days, and, immediately after, an epidemic of encephalitis lethargica broke out all over Austria, and in Bohemia and Bavaria. This Austrian epidemic showed exactly the same characteristics as the Italian cases described above; further, there was almost constant pupillary

involvement. Differences of tendon-reflexes were noticed in many cases, and complete absence of patellar and ankle-jerks was by no means rare. In addition to the cases showing motor excitation, several were noticed which closely resembled tabes, and besides the pupillary and reflex changes these were characterized by disorders of the bladder and painful tendinous contractions. In the epidemics of 1920 the mortality was high at the commencement of the illness, and had no relation to the intensity of the clinical symptoms: patients frequently died during the preliminary stages of the illness, death being due to toxæmia of the brain rather than to localized cerebral inflammation. In these cases, fatty or parenchymatous degeneration of the liver and kidneys was often found, while the brain and spinal cord were very soft. Hyperæmia was usually not prominent, and the small hemorrhages of ordinary encephalitis lethargica were generally absent, while microscopically signs of intoxication, such as paleness of the Nissl's granules and an increase in the nuclei of the neuroglia, were the most notable features.

In reviewing the cases of encephalitis lethargica described, it may be seen that each epidemic showed a distinct polymorphism, and it is necessary in describing the disease to present a series of clinical pictures for each epidemic. There is no one constant symptom, and the variation in the clinical picture is determined by the different localization of the inflammatory processes. Furthermore, the mode of action of the virus on the individual varies from one epidemic to another. For example, there is sometimes fever, in other cases this is absent, sometimes there is severe toxæmia, sometimes profound prostration, herpes, and disorders of other systems. Usually the course is acute or subacute, but fulminant and chronic cases have been noted. As to the causal organism, the Gram-positive coccus first described as the pleomorphic diplostreptococcus of Wiesner has been generally found, and it is possible that the variation in form characteristic of the organism may account for variability in the symptomatology.

The author does not consider that encephalitis lethargica is really associated with influenza, though the initial symptoms may be similar: as a rule patients have not suffered from influenza previous to the outbreak of nervous symptoms. It would seem that it was only by chance that certain epidemics of encephalitis lethargica coincided with those of influenza, while other epidemics of the former disease were in no ways associated with the latter. It may be that the occurrence of influenza favours the development of encephalitis, and there is no doubt the onset of both diseases is favoured by the occurrence of chill.

R. G. GORDON.

[120] **Lethargic encephalitis** (L'Encéphalite léthargique).—A. NETTER.  
*Presse méd.*, 1920, xxviii, 193.

Forty-five patients were observed in the series under review. The mortality was 14 (or 30 per cent). The commonest grouping of symptoms was fever, ocular palsies, and drowsiness; but the other conditions which have been described with this disease (hemiplegia, local muscle clonus,

tremor, catatonia, mental excitement, sensory disturbances, etc.) were also noted. The duration varied from one week to three months. A relapse must not be unexpected in a case where apparent recovery is taking place. In the early stage the diagnosis from typhoid, influenza, tuberculous meningitis, and cerebral tumour may be difficult. Examination of the cerebrospinal fluid is of considerable value here. The cell-count and protein content are not materially increased, but the sugar percentage was much increased in six of the cases.

Botulism may be differentiated by the absence of temperature, the presence of alimentary disturbances, and the fact that other members of the household are also affected. Lethargic encephalitis is a disease *sui generis*, and differs essentially from poliomyelitis and influenza, to which diseases, at varying times, it has been thought to be related. Historically, Netter reminds us, a descriptive account which accords with the disease as we now know it is met with again and again from the earliest writings onwards. Its occurrence in epidemics is entirely parallel with the known behaviour of other infective diseases. Thus he concludes: (1) The disease is no new disorder; (2) The virulence of the infective agent, as shown by the occurrence of epidemics of the disease, is made variable by the same external conditions which affect other micro-organisms.

The latest work shows that the virus is filterable through a porcelain filter, and that the filtrate is able to infect a monkey if the injection is made into the subdural space. It is present in the secretion of the nasopharynx of the patient, and accordingly prophylactic measures should be based on this.

*Treatment.*—Apart from the relief of symptoms, therapeutic measures may be directed towards destroying the morbid agent. In the first place, urotropine is of value owing to the appearance of formol in the spinal fluid fifteen to twenty minutes after the drug has been given. In the second place, antisera need to be considered. Injection intrathecally of serum from a patient in the recovery stage of the disease has not, however, met with success.

The writer has had some success in treating his cases with jaborandi (or injections of pilocarpine). He points out that, inasmuch as the virus is present in the saliva, it is permissible to direct one's efforts to increasing glandular secretions in the hope that an increased amount of the virus may be got rid of in this manner. Salvarsan and its derivatives, he agrees, are of no value in the disease and may even be harmful. Finally, he suggests that subcutaneous injection of turpentine in order to produce abscess-formation (so-called fixation abscess) may be tried. This method has been recommended as an attempt to localize and anchor the infection in disorders where the infection is generalized. It will be seen by the reader that there is, as yet, no definite line of specific therapy.

W. JOHNSON.

[121] **Myoclonic encephalitis** (L'Encéphalite myoclonique).—J. A. SICARD, *Presse méd.*, 1920, xxviii, 213.

THIS condition constitutes one of the several definite types which compose the disease 'lethargic encephalitis'. As a rule it is stated that lethargy

is absent: the characteristic symptom is a state of clonus in parts of a muscle or groups of muscles. Sometimes it is coarse and shock-like, similar to the contractions resulting from rhythmical electric stimulation: at others it is quick and fine, or even choreiform in character. In one case quoted, the contractions occurred every two or three minutes, followed by a short period of quiescence. They involved sometimes one side of the abdominal muscles, sometimes all the muscles of the epigastrium, including also the diaphragm, and the muscles of the extremities to a less degree. Sleep did not abolish the movements. There was no drowsiness, and ocular symptoms were absent, but pain was a marked feature, and eventually death was ushered in by an acute confusional state. In other cases the myoclonic movements involved various parts of the body in different degrees—the abdomino-diaphragmatic region, however, being most frequently affected—and speech was a little difficult. The cerebrospinal fluid showed no marked change: superficial and deep reflexes, sensation, and sphincters were normal. An acutely delirious state not infrequently preceded a coma which terminated fatally. An account is given of five cases which came under the author's notice in the course of a few months. Not every one will be able to agree with his view that absence of lethargy is a conspicuous feature in the myoclonic form of lethargic encephalitis.

W. JOHNSON.

[122] **An acute descending radicular type of epidemic encephalitis.**

— I. H. PARDEE. *Arch. of Neurol. and Psychiat.*, 1920, iv, 24.

PARDEE reports eight cases of epidemic encephalitis conforming to yet another new type, which in many of its features resembles the 'syndrome radicaire' of Dejerine. The chief symptoms are: (1) sharp lancinating root pains, (2) paræsthesiæ, (3) muscular spasms, (4) hyperæsthesiæ, (5) delirium, and (6) fever.

The clinical course of the disease is peculiar. Following sensory symptoms in the arm and neck, it progresses downwards in an orderly manner. Radiating pain around the upper chest develops, then girdle sensations and tightness around waist. Pain and sensory disturbances in the arms become less severe, and spasmodic twitching movements of one or both abdominal recti or transversalis muscles appear. From the onset of symptoms until the severe arm pains cease, about eight or ten days elapse. The symptoms then confine themselves largely to the intercostal and abdominal regions for two or three days. There is generally delirium at this stage, but the pains are usually less severe. The symptoms then descend to the lower extremities; there is a tremendous recrudescence of the pain, which extends down the legs with shock-like intensity. Paræsthesiæ and muscular spasms involve the legs. A slight increase of the fever precedes the invasion of the lumbosacral region, and after four or five days there is a return to a 99° or 100° temperature. The course then becomes more subacute, accompanied by mild fever, a moderate number of light, fleeting root pains, and some paræsthesiæ. The patient then progresses towards a slow convalescence of many weeks' duration. At this time the twitchings in the arms and legs have resolved themselves into



an intention type of tremor which is coarse and oscillatory, and disappears when the patient is at rest. There are no vasomotor, trophic, or sensory changes other than those mentioned above, and the reflexes show no characteristic change. One peculiar symptom of interest, noted in all patients, was an involuntary flexion of the head: this was not necessary for the patient's comfort, as motion did not produce or increase pain. In the single case which did not recover there was a definite history of influenza with a pneumococcus Group I pneumonia, which preceded the radicular syndrome by about ten days.

The author remarks on the frequency of pains occurring as sequelae to, or independent of, acute influenza during the winter of 1919, and considers that the close relationship between radicular pains and influenza, and their similarity to the radicular types of epidemic encephalitis, may suggest a possible, but as yet unproved, common etiology.

R. M. S.

- [123] Encephalitis with involuntary movements.—R. C. HAMILL. *Arch. of Neurol. and Psychiat.*, 1920, iv, 44.

A CLINICAL account of four cases of epidemic encephalitis of the myoclonic type. The manifestations conformed closely to those described by Boveri, Sicard, and others. In three cases the rhythmic involuntary movements were decidedly more marked during sleep, and when awake the patients were quite unconscious of their occurrence. The clonic, twitch-like, rhythmic bilateral movements of muscles used in forced respiration had a definite relation to the respiratory rhythm, the rate of twitching being either equal to, or double, the respiratory rate. This is well brought out by the excellent kymographic tracings illustrating the paper.

The author regards the bilateral movements as expressions of the involvement of some complex or centre in the mid-brain or hind-brain that is in direct connection with the respiratory centre.

R. M. S.

- [124] Clinical and pathological contribution to the study of apraxia (Klinischer und pathologisch-anatomischer Beitrag zum Studium der Apraxie). MINGAZZINI and CLARIA. *Jahrb. f. Psychiat. u. Neurol.*, 1920, xl, 24.

THE authors have published a particularly useful study on the difficult subject of apraxia in which, apart from a résumé of previously recorded pathological cases, they describe with considerable minuteness two cases of their own. The first was that of a man of 60 who had had two strokes, the first of which caused slight left hemiparesis, while the second added some sensory defects to the left limbs. Examination showed in addition a typical ideokinetic dyspraxia on the left side. At the post-mortem a small lesion was found in the right internal capsule, and a second destroyed the anterior third of the corpus callosum. In the second case a dyspraxia of the face and tongue was associated with a lesion also in the anterior third of the same part of the brain.

The authors discuss in great detail the significance of their own and

analogous cases from the literature, and come to the conclusion that there are two parts of the brain where lesions are especially prone to be associated with apraxia, the first of which is the middle and anterior thirds of the corpus callosum, and the second the left inferior parietal lobule. The student of the subject will find this paper informative and clearly expressed.

S. A. K. W.

[125] Nystagmus of the eyelid and incomplete ptosis (Lidnystagmus und inkomplette Ptosis).—E. POPPER. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lviii, 49.

APART from recent papers by Pick and Sittig, the subject of nystagmus of the eyelids has received little attention. In the cases hitherto described, blinking movements of the lids were associated with typical nystagmus of the eyeballs. The lesions varied in nature, but were always situated in or near the nuclei of the nerves supplying the ocular muscles. Popper, in a short paper, describes a new case of great theoretical interest. His patient suffered from disseminated sclerosis and had a partial ptosis of the right eyelid. When the eyes were turned to the right, there was little or no nystagmus of the eyeballs, but the right lid moved up and down exactly in the manner described in the earlier cases of nystagmus of the lids. On looking to the left, typical nystagmus was seen, and this was associated with movements of the lids, which were distinctly greater on the right side. This case corresponds with those already described in that the intensity of the lid movements depended to a certain extent on the degree of the nystagmus—they were greatest on looking to the left.

The peculiar feature of the case is that the lid nystagmus was always greatest in the weak right lid, and that on looking to the right it appeared on the right side only, even when nystagmus of the eyeballs was absent. This proves at once that the lid movements are not caused mechanically by the movements of the eyeballs. To what then are they due? Taking for granted the existence of a stimulus which produces a well-sustained nystagmus to the left and occasionally slight nystagmus to the right, and which spreads to the levator nuclei, the special sign in this case can be explained by assuming that the stimulus is present whether the eyes are directed to the right or left, although it is too weak to produce nystagmus to the right constantly, and that the stimulus which reaches the damaged right levator nucleus by diffusion finds there a point of diminished resistance and causes lid nystagmus even when nystagmus of the bulbs is absent.

The fact that the lid nystagmus was always greater in the weak lid receives great emphasis, and is considered by the author to indicate that a damaged nucleus is more susceptible to stimuli which reach it by diffusion than is a healthy nucleus. The importance of the conception of diffusion of stimuli in the study of associated movements, and its bearing on the problems of localization of function in the brain, is apparent.

W. J. ADIE.

- [126] **Quadrigeminal neoplasms** (Le syndrome néoplasique quadrigéminal).—J. LIERMITTE. *Gaz. des Hôp.*, 1920, xciii, 149.

THE author relates the case of a soldier, age 24, who was found post mortem to have had a glioma involving the corpora quadrigemina.

The symptoms had been very marked, the more important being great inco-ordination of the lower limbs, vertigo, auditory hallucinations, hypersomnia, polyphagia, and adiposity. The first two he explains as being due to compression of the superior cerebellar peduncles and the lateral auditory tract. The other more general symptoms were the result of the increase in intracranial pressure so constant in cerebral neoplasms. The author further notes that his patient had sustained a penetrating wound of the right parietal bone without perforation of the dura mater, and it was four months after recovery from this that the vertigo, vomiting, and inco-ordination appeared. It is suggested that traumatism is an important etiological factor in the development of central neoplasms of the brain.

J. E. NICOLE.

### TREATMENT.

- [127] **Treatment of neurosyphilis by small repeated injections of salvarsan over a prolonged period** (Traitement de la syphilis nerveuse par les injections novarsenicales à petites doses répétées et prolongées).—J. A. SICARD. *Presse méd.*, 1920, xxviii, 281.

THE present treatment of neurosyphilis by a series of some six injections of salvarsan in conjunction with the administration of mercury is considered by the writer a tacit convention which is followed in order to avoid pitfalls due to inherent dangers in the drug. For two years and more he has been engaged in investigating the value of small daily doses of salvarsan over a prolonged period.

*Technique.*—0.15 gm. of the drug is dissolved in 1 c.c. of distilled water and injected intravenously or subcutaneously. The author inclines to the latter method, daily injections being given under the skin on alternate sides in the region of the thigh below the great trochanters. A nurse can be taught to perform the injection with ease. There is a remarkable absence of local reaction.

*Administration.*—In the course of a year, about 30 grms. may be administered. In general paralysis of the insane 0.15 gm. is injected intravenously each day, so that not more than 8 grms. are administered in every three months. To tabetics who are in the active stage of the disease the author gives 20 to 25 grms. annually by injecting every week two doses of 0.15 gm. subcutaneously and one dose of 0.3 gm. intravenously. In this way certain of his patients have already received between 40 and 50 grms. of salvarsan (either novarsenobenzol, sanar, or galyl). No mercury or potassium iodide is given, and the results have been better than those obtained with the latter.

The author next passes to a discussion of the accidents appertaining to the use of injections of salvarsan. In 200 cases treated by his method he has never seen any serious complications result. But certain secondary effects have been noticed:—

*a. Erythematous reaction.*—One form, of no special significance, is seen during the commencement of treatment, usually occurring in the neighbourhood of the site of injection, and being accompanied by a slight rise in temperature. Another form is seen towards the end of the course of treatment after the patient has received from 5 to 10 grms. of the drug. It consists of an erythematous reaction limited to the area of skin painted with iodine for the purpose of the injection, and is an indication that the limit of arsenical tolerance has been reached.

*b. Alteration of the tendo Achillis reflexes.*—Somewhere about the fourth or fifth week, during the administration of the daily dosage, one or other of the ankle-jerks as a rule is found to be diminished and may become abolished. This occurs after 7 to 10 grms. of the drug have been injected. The patient usually makes no complaint unless it be of a slight degree of paræsthesia, and there is no disturbance of walking. The calf muscles show slight decrease in electrical excitability. The anterior tibial group and also the thigh muscles are affected to a much less degree, but in one case a condition of general peripheral neuritis was observed. In those cases where the ankle-jerk has become abolished it has never been observed to reappear again. The decrease in this reflex will continue for some days after the cessation of the injections—a practical point of considerable importance. It would thus seem that arsenic, administered by this method, attacks the neuromuscular mechanism, particularly of the internal popliteal nerve. The abolition of the ankle-jerks suggests its employment especially in syphilitic spastic disorders, for, in addition to an attack on the disease, the spasticity is incidentally diminished.

*c. Arsenical jaundice* occurred only in 2 per cent of the cases treated by Sicard's method.

*d. Transitory albuminuria* has been noted usually after 7 or 8 grms. of salvarsan have been administered; also a slight degree of œdema, which clears up rapidly on discontinuing the treatment.

*e.* A slight increase of the patient's weight occurs at first. When the 9- or 10-grms. stage is being reached the weight begins to go down, and this is taken as an indication for the suspension of treatment.

*f.* No visual or auditory disturbances have resulted, and in no case has any alteration in the optic discs been observed.

Sicard concludes by noting the absence of toxic and fatal effects in his patients as compared with those cases which are treated with the large doses now in vogue. Clinically, he is satisfied with his results, and states that the Wassermann reaction of the blood and cerebrospinal fluid is effectively rendered negative.

W. JOHNSON.

[128] Section of the anterolateral columns of the spinal cord for the relief of pain.—C. H. FRAZIER *Arch. of Neurol. and Psychiat.*, 1920, iv, 137.

A REPORT on a series of 6 cases in which the operation of chordotomy was performed for the relief of pain. In 3 the source of pain was a malignant lesion, and in 3 gunshot wounds of the spinal cord or lumbosacral plexus.

The results of operation were good: in 4 there was complete, and in 2 partial, relief. Although the operation demands accuracy and considerable operative skill, the author considers it less difficult to perform than division of the posterior nerve-roots, and it carries with it the additional advantage that the surgeon can select the segment at which the cord section is to be made. It may be laid down as a general rule that the section should be made at least four segments above the lesion, so as to ensure the crossing of all afferent tracts and to allow for the extension of the growth upwards. Two sections are planned so as to include the anterolateral tracts in which fibres subserving the conduction of pain sensibility are grouped: the temperature fibres are also divided, and it is necessary to sacrifice those running in Gowers' tracts. As section of the column would not, under any circumstances, be made high enough to include the brachial plexus, loss of thermal perception in the trunk and lower extremity is relatively unimportant. The section begins at a point midway between the anterior and posterior roots, and is carried forwards as far as the anterior root, which may with propriety be divided in order to ensure division of the entire tract. The determination as to depth seems to be the chief difficulty of this procedure: unless the knife penetrates the cord to a distance of 2.5 mm., total division of the thermal and pain fibres may not be achieved.

R. M. S.

- [129] Neuralgias of the head, and their treatment by firm pressure on painful spots (Sur les névralgies de la tête et leur traitement par l'écrasement des points douloureux).—M. W. JANOWSKI. *Presse méd.*, 1920, xxviii, 537.

The forms of headache resulting from neuralgia of the trigeminal or occipital nerves deserve attention chiefly from the point of view of treatment. In neuralgia of the occipital nerve there is marked tenderness on deep palpation of the nerve where it emerges in the occipital region, and the patient complains of severe pain radiating in the direction of the skin area supplied. Where the trigeminal is the nerve concerned, the symptoms will depend on the particular branch which is affected. Most frequently it is the first division, and when both sides are involved the patient complains of headache of an ordinary character (frontal and temporal). Pressure over the nerve in the neighbourhood of the supra-orbital foramen suffices to distinguish the neuralgic form. In these cases pressure over the infra-orbital foramen also will show that the second division is not infrequently slightly affected. The zygomatic branch of the second division may also be tender on pressure, and less frequently still the branch emerging in the canine fossa. The third division of the fifth nerve is very rarely affected. Its involvement is indicated by tenderness on pressure over the foramina of exit of the branches emerging through the inferior mandible.

Where the paroxysms of pain are severe, the picture of migraine may be closely simulated: ear disease and meningeal and cranial disorders must also be carefully excluded. The author lays stress on the necessity for palpation of the nerves at the various points indicated, in all cases of headache of uncertain origin.



*Treatment.*—Firm continued pressure on the painful points has produced excellent results. If the occipital nerve exits are being pressed on, the patient's head must be placed with the forehead supported against the operator's chest; the head must always be steadied sufficiently for firm pressure to be maintained. The tip of the index finger is then placed over the required foramen and is pressed repeatedly in, as firmly as possible. The pressure is maintained from a half to one complete second and then relaxed, without, however, the finger being removed. The manoeuvre is repeated about a dozen times, and is carried out as a daily procedure. There is considerable pain for the first six days; treatment is then stopped for two or three days, after which a new series of six days may be recommenced. As a rule, four series of the six-days' treatment are sufficient, but severer cases may require up to nine series. The method is admittedly painful, but the author, after practising it for thirty years, is satisfied with the results which it gives. He points out that it is less technical than the more usual alcoholic injections, and may therefore be carried out without the special instruction which the other method requires.

W. JOHNSON.

- [130] Treatment of epilepsy by luminal (*Traitement de l'épilepsie par la phényléthylmalonylurée*).—L. CHEINISSE. *Presse méd.*, 1920, xxviii, 598.

LUMINAL is closely allied to veronal, the ethyl group of the latter drug being replaced by a phenyl group. First used in Germany in 1912, evidence has been gradually accumulating as to its value in controlling epileptic seizures, of both the convulsive and the psychic variety. Certain observers have noted a tendency, however, to mental confusion or excitement in the patient under treatment. It is stated that this tends to disappear as the drug is continued. The attacks themselves become controlled much more quickly than when potassium bromide is administered. Good results are not obtained in cases of hystero-epilepsy.

Usually a half to one grain twice a day is the dose given, the maximum dose being eight grains. Headache, vertigo, a mild rash, and the mental state already mentioned have occasionally occurred as therapeutic sequelæ. These appear during the first two or three weeks of the administration of the drug, and pass away as the patient develops an apparent tolerance. He should accordingly be carefully watched during the commencement of treatment. Luminal does not cure epilepsy, but exercises a strong controlling influence over the seizures. If, therefore, for any reason the treatment is to be suspended, the drug should be slowly and not suddenly withdrawn.

W. JOHNSON.

- [131] Co-operation by internist and surgeon in the treatment of Graves' disease.—H. LISSER. *Endocrinology*, 1919, iii, 454.

In this short paper are discussed without prejudice the results to be obtained by surgical as opposed to non-surgical methods of treatment. The author admits that surgery at times obtains brilliant and spectacular results, but he recognizes and deplors the relatively high mortality. As

regards medical treatment, he especially advocates absolute rest under the care of a good nurse, an ice-bag to the neck, a high calorie diet (2500 to 3500 calories), quinine hydrobromate 5 gr. plus ergotine 1 gr. in gelatin-coated capsules t.i.d.s. as advised by Forelleheimer, and the application of x rays to the thyroid or thymus, or to both.

On the whole he inclines to the view that the best results are to be gained by close co-operation between physician and surgeon, but the indications particularly calling for surgical interference and the precise surgical measures to be adopted are not specified. He concludes with the sound advice that the surgeon should not be too hasty, nor the physician too patient.

J. L. BIRLEY.

[132] The rational therapeusis of exophthalmic goitre.—1. BRAM.  
*Endocrinology*, 1919, iii, 167.

THE author regards the surgical treatment of exophthalmic goitre as "the latest fad in the art and science of medicine", and is of opinion that, except when severe pressure symptoms predominate, this disease "is no more a subject in the realm of surgery than pneumonia and typhoid". As evidence that surgeons themselves are somewhat at sea in the matter, he enumerates the various surgical procedures which have from time to time been adopted, e.g., hemithyroidectomy, ligature of carotid or thyroid arteries, cervical sympathectomy, injection of boiling water or of quinine into the thyroid substance, or even resection of the colon.

His objection to surgical interference on theoretical grounds is based on the absence of proof that the thyroid is the organ which is primarily at fault: but the same argument might be advanced against splenectomy in splenic anaemia, and is in fact no argument at all. His practical objections are: (1) The high immediate mortality (4 to 5 per cent); (2) Disfiguring scars; (3) Myxoedema, tetany, recurrent laryngeal palsy, etc.; and (4) The failure to cure permanently. It would appear to the reviewer that the first three objections may reasonably be attributed to bad surgery. With the last objection few would disagree, but the same might be said of the results of non-surgical treatment. Not so Dr. Bram, however, who "does not hesitate to conclude that he has been able to cure every case of primary Graves' disease, in which a fair degree of co-operation was obtainable, in from six months to two years". Such being the case, it is a little disappointing to find that no details of the therapeutic methods by which these happy results are effected are vouchsafed to the expectant and hungry reader, who is merely informed that "strict individualization is the dominating principle, together with a proper medical attendant and the right social atmosphere, in conjunction with appropriate dietetic, hygienic, medicinal, psychotherapeutic, electrotherapeutic, and other measures". Our disappointment is heightened still further when we learn that the cases which resist the author's therapeusis are not cases of genuine exophthalmic goitre at all.

J. L. BIRLEY.

## Psychopathology.

### PSYCHONEUROSES AND PSYCHOSES.

- [133] Influence of the war upon the concepts of mental disease and neuroses. —SIDNEY I. SCHWAB. *Mental Hygiene*, 1920, iv, 651.

THE author regards the war from the point of view of the scientist as a mass of uncontrolled experiment, and briefly reviews the results in the field of knowledge appertaining to the nervous system. As far as pure neurology is concerned, he finds nothing of note save in the matter of physiological problems associated with the regeneration of injured nerves; but he feels that much of the pre-war morbid psychology has to be viewed from a new standpoint. Summarizing his conclusions he says that a true understanding of the neuroses must be based upon a psychology of instinct in which the primitive instinct of self-preservation and the emotion of fear have translated themselves into a protection for the individual under the guise of a diseased picture, the restricted Freudian conception having been replaced by a more generalized instinctive basis. The author also regards certain groups of the psychoses as episode-reactions closely related in origin and mechanism to the neuroses, but implying a more profound disturbance of consciousness. He considers that the object of all psychotherapy is to influence the patient in such a way that the conflict-situation developed in the mind may be faced openly. The patient is taught to rely upon his ability to face the problem rather than on any instinctive process of defence and protection.

THOMAS BEATON.

- [134] The psychopathology of alcoholism and some so-called alcoholic psychoses. —C. STANFORD READ. *Jour. of Ment. Sci.*, 1920, lvi, 233.

THE purpose of this paper is to emphasize the psychogenetic factors in the production of psychoses associated with alcohol. The unconscious motivation of alcoholic indulgence is the avoidance of mental pain, and the pleasure aroused by its imbibition is not exclusively physiological in origin; but its effect is to narcotize the higher mental processes and to permit the release of trends normally kept in check by the repressing force of social taboos. In the alcoholic psychoses the toxic effect of alcohol is not the chief causal agent, but only a contributory one. Analysis nearly always reveals an emotional factor as the actual predisposing cause. Attention is drawn to the fact that clinical pictures are often observed, identical with those found in the alcoholic psychoses, in which a history of alcohol is absent. From observations based upon his own clinical material, Read finds that alcoholic paranoid conditions, with delusions of jealousy, erotomania, persecution, and grandeur, are often found to depend on a repressed impulse of a homosexual nature which in the psychosis finds an outlet by 'projection', after the manner described by Freud in his analyses of persecutory states. The paper concludes with considerations in relation to the wider social aspects of alcoholic indulgence.

II. DEVINE.

- [135] Syphilitic scars of the spirit.—JOSEPH COLLINS. *Jour. Amer. Med. Assoc.*, 1920, lxxiv, 1246.

THE whole question of syphilitic disease of the nervous system has not received the attention it deserves in medical literature, but the minor mental and emotional changes accompanying this disease have received no attention at all. The author attributes this to their variability both in severity and nature, but emphasizes how great an effect this may have on the career of the patient. He considers that the treatment of syphilis by mercury and arsphenamin until the Wassermann reaction has remained negative for a long time, has diminished the incidence and severity of syphilis of the nervous system to a very great degree. He points out the results of adequate treatment, which sometimes restores function completely, but often leaves behind it a scar which is only obvious to the patient's intimates and yet has a marked influence on his career, as, for example, when slight changes of emotional and intellectual capacity result from a syphilitic encephalitis.

A case is quoted of a young man, age 26, who had a severe attack of cerebral syphilis while under mercury treatment, but under the influence of arsphenamin and mercury he recovered entirely so far as Wassermann tests, cerebrospinal fluid reactions, and physical signs were concerned. However, after his recovery he never succeeded in holding a situation for long, never gave satisfaction to his employers, and could never undertake work of responsibility, whereas before he had been head of a department store, and had been regarded by all his employers as a man of great promise. He lost his power of initiative, and took no pleasure in his amusements or friends, though he had good insight into his condition and realized he could not do as well as he used to do. His memory and concentration were very fair, but his affective state was almost negative.

More than three years later he had no physical symptoms of disease of the nervous system, and the Wassermann reactions of his blood and spinal fluid were negative, but nevertheless he still bore the 'scar of syphilis on his soul'.

R. G. GORDON.

- [136] The study of malingering with the methods of biochemical investigation (Lo studio delle simulazioni con metodi di indagini biochimiche). CUNEO. *Riv. Speriment. di Freniat.*, 1919, xliii, 325.

PROFESSOR CUNEO contributes this suggestive article. His general contention is that if the symptom complained of actually exists, there will be a biochemical change to represent it. Thus, genuine epilepsy is always associated with characteristic changes of proteid metabolism, trigeminal neuralgia with well-marked nitrogen retention, cerebrospinal neurasthenia with 'irregular and disordered mal-assimilation of albumen', renal calculus with the presence of oxalic acid in the urine, and so on. While we are prepared to agree with this theory, we are inclined to think that it will have more practical value in the next war, or possibly in the next century,

than at the present time. We should venture to protest against the assumption that a truly disabling morbid condition must necessarily be confirmed by an organic change discernible in the laboratory. The most balling malingerer with whom the present writer has had to deal complained of one thing only, namely, that whenever he saw an officer a voice said to him, quite clearly, and always in the same tone, "Cut his throat": in consequence of which the man developed a phobia of knives. It would be interesting to know what exact change in the nitrogen metabolism of the body was associated with this condition.

We notice in the same number of the *Rivista* a most interesting and laudatory obituary article on Henry Maudsley. The writer points out the great influence exerted by his work on mental physiology and pathology throughout Italy during the second half of the last century, and mentions with regret the very inadequate translation that his work has received in the Italian language.

H. CRICHTON MILLER.

[137] Mental disease in families.—ABRAHAM MYERSON. *Mental Hygiene*, 1919, iii.

THE author reviews the standing conceptions of the transmission of mental diseases. He refers to the classical doctrine of Esquirol and Morel, that all forms of insanity and eccentricity are manifestations of one condition, which is inherited and inheritable degeneracy; to the views of Sioli and Vorster, who, on the other hand, declare that there are certain groups of mental disturbance which are related—thus, that manic-depressive insanity and dementia præcox exclude one another in heredity; and also to the view of the more moderate Jolly, Allrecht, and Pilez, who find that a dissimilar heredity exists, but that the main trend is towards a similar. He discounts the conclusions of the Davenport and Rosenoff investigations, which he considers were made not so much to establish the laws of transmission of mental disease as to fit the facts to the Mendelian theory. The author then gives the statistics and conclusions based upon a survey of 23,000 admissions to the Taunton State Hospital. He finds that the paranoid and catatonic diseases, præcox or otherwise, trend to dementia præcox or to feeble-mindedness in the insane descendants; that manic-depressive disease is succeeded by manic-depressive and, in a varying proportion of cases, by dementia præcox; that the senile and involutional psychoses trend towards paranoid disease and dementia præcox. It is to be seen, therefore, that all roads seem to trend to dementia præcox and thence to imbecility, which may be congenital dementia præcox with an early dementia as a leading feature.

The reputed relationship between genius and insanity finds no examples in the Taunton cases, while the author finds that criminality is more closely associated with forms of feeble-mindedness and alcoholism than it is with insanity.

He concludes with the statement that there is no basis for any theory of heredity in the psychoses. The psychoses may represent disease processes rather than the operation of an hereditary mechanism, or they may



represent abnormal variation—so that insanity in some of its phases may be a disease or abnormality merely by excessive variation rather than by any defect of any character. He points out the need for an organized research into the descendants, whether insane or not, of syphilitics, alcoholics, and of the insane confined in hospitals.

THOMAS BEATON.

[138] **The war neuroses as physiologic conservations.** —S. I. SCHWAB.  
*Arch. of Neurol. and Psychiat.*, 1919, i, 579.

FOLLOWING an account of the development, organization, and function of the neurological base hospital of which he was the director, Schwab indicates that the problem of the war neuroses has three aspects. There is the military point of view to be kept constantly in the foreground. If this had been done generally, many mistakes would have been avoided. This view is essentially that the patient should be returned to his former status as a soldier, with the assumption that this is a perfectly possible thing to accomplish. Such an attitude and aim on the part of the whole staff of a neurological hospital has incalculable therapeutic effects, and tends of itself to bring about the desired results. Then there is the medical problem. A war neurosis is the product of traumatic experiences causing the organism to respond by abnormal reactions which tend to become fixed and organized. There is a fixed etiology, a varying effect from the traumatic incident, and a therapeutic aim directed towards the return of the patient to the conditions which first produced the neurosis. Lastly, there is the elucidation of the mechanisms, an aspect which needs greater emphasis than the question of clinical types or symptomatology. The view is developed that the war neuroses are to be regarded as a defensive mechanism or as part of a system of physiological conservations. Such protective reactions are innate; in all living organisms there exist sets of factors which save them from destruction, and their expression is automatic, unconscious, and outside the volitional sphere. The discussion of this question leads the author to attempt the differentiation of neuroses and psychoses on biological lines. His remarks are significant, and may be quoted:—

"A psychosis in the long run always acts to the disadvantage of the individual, both in relation to his immediate environment and to society. Its origin, therefore, must lie in processes of consciousness which are permanently abnormal, destructive, and constantly departing from a normally acting intelligence. Sooner or later a psychosis brings the individual in conflict with himself, his class, and society. The neuroses, on the other hand, never do this, nor can they do it. For, as their origin and purpose are fundamentally protective, a conflict leads to the enfeeblement and eventual disappearance of the individual out of his environment. The neuroses, are, therefore, protective mechanisms which tend to guard the individual from the immediate event for which he lacks proper personal adaption. The psychoses, on the other hand, serve no protective purpose whether immediate or remote, but on the contrary tend logically to the destruction of the individual in the conflict of events. They are

permanent deviations, progressive in type, which arise without set purpose, and are the consequences of abnormal processes in consciousness. They tend to the elimination, not the saving, of the individual. In the struggle with society it is generally the individual who succumbs, either as a living organism or as a member of the social order. The neuroses, on the other hand, are the products of an intelligence awake to the needs of the individual, and are structures of compromise between him and society. They tend to shield him, and so do harm to society. They arise in consciousness from fully realizable premisses, but tend to become automatic, and without the individual's awareness, so that he reacts to them instead of the things he is cognizant of in his own make up."

Clinical descriptions are given of the individual types of disorder, which are based on a classification which developed of itself, as it were, from the practical needs of the moment, such as therapeutic methods, prognostic experiences, disability classifications, and characteristic sets of mechanism. Having described his methods of treatment, and summarized his conclusions, Schwab expresses the hope that the understanding of the mechanism and the therapeutic methods in these war cases may exert an influence in approaching the problems of the civilian neuroses. The paper is of considerable value and importance.

II. DEVINE.

- [139] The reactions of the visceral nervous system in anxiety states  
(Les réactions du système nerveux viscéral dans les états anxieux).  
—J. EUZIÈRE and J. MARGAROT. *L'Encéphale*, 1920, xv, 349, 361.

THE authors claim that the French writers on the anxiety states have presented clinical pictures of the psychology of these conditions whose clarity and precision compare favourably with those of the Freudian school. *Angoisse* is a subjective phenomenon which is experienced under different circumstances, but these may be divided into two groups. Sometimes the symptom is of somatic origin, and forms part of a clinical picture which usually involves the cardiovascular system, and accompanies and modifies certain painful sensations. At other times it directly depends on psychic abnormalities, and is the physical accompaniment of anxiety. Whatever may be its origin, it is hard to define, and it appears to the patient as if his visceral existence has stopped, while at the same time certain spasmodic affections occur within his body.

The physical manifestations of *angoisse* depend on the exaggerated activity of the sympathetic system. Over-action of the sympathetic causes constriction of the vessels of the head, accounting for the pallor and feeling of emptiness of the head complained of by the subjects of *angoisse*. Similarly the ocular defects—exophthalmos, mydriasis—are familiar results of stimulation of the sympathetic. The dry mouth, shivering, goose-flesh, cold sweat, palpitation, rapid pulse, sensation of thoracic constriction, occasional incontinence of urine, and all the other phenomena of *angoisse*, correspond to sympathetic overactivity.

Sometimes, in the later stages of an attack of *angoisse*, symptoms appear which point to a compensatory reaction of the vagal system, as

for example, the flow of tears: but with the dominance of the more tonic vagal control the *angoisse* disappears and the patient calms down, a fact which confirms the popular belief in the relief afforded by tears. Frequently after an attack the patient suffers from polyuria and diarrhoea, phenomena definitely associated with vagotonia. The manifestations which depend on the voluntary muscles, such as the primary immobility and drawing of the face, and the subsequent trembling and unorganized movements, are connected less with *angoisse* than with its influence on voluntary control. It may be said then that *angoisse* is manifested when the activity of the sympathetic is preponderant, and stops when this ceases to be so.

There follows a record of twenty-nine cases of 'permanent anxiety states', whose arterial pressure and oculocardiac reflex were observed as a test of sympathetic overactivity. In all the pressure was raised, and was never lower than maximum 140, minimum 90. The inversion or abolition of the oculocardiac reflex was noted in the majority of cases. Thirty-one cases are quoted in which anxiety occurred at infrequent intervals, and in which the signs of sympathetic overactivity were frequently noted, but less constantly than in the preceding group, while symptoms of vagotonic reaction tended to alternate with these.

Finally, the authors refer to the difficult question whether the emotion or the physical manifestation is the primary phenomenon. They conclude that the anxiety states tend to occur in those subjects whose autonomic nervous system is so constituted that the sympathetic system is preponderant. The cases of ten patients are quoted whose ailments were essentially physical and not psychical, whose blood-pressure was permanently raised as a result of organic lesions, and who presented other signs of over-activity of the sympathetic. In all these *angoisse* was present, accompanied by the emotion of anxiety. From this they conclude that the anxiety is secondary to *angoisse*. Another argument pointing to the same conclusion is afforded by the anxiety observed in those disturbances of endocrine activity which result in overaction of the adrenals and consequent hypertonia of the sympathetic system. Such a state of affairs occurs at the menopause, when the activity of the ovaries is suppressed, and the frequency of anxiety states at this time is notorious. From these observations they conclude that when the researches in organotherapy have afforded us a means of lowering sympathetic activity, a therapeutic agent will be found for combating the anxiety states.

R. G. GORDON.

## PSYCHOLOGY AND PSYCHOPATHOLOGY.

[110] The experiences of the child: how they affect character and behaviour. C. MACFIE CAMPBELL. *Mental Hygiene*, 1920, iv, 312.

A BRIEF statement of the aims of infant psychology. It presents an appreciation of the work of J. B. Watson, and gives many examples of the kind of material he has dealt with. These show how experiences during infancy may influence the whole future of the individual, producing

undesirable traits of character which at the adult stage it is difficult or even impossible to correct. The importance of training the child in reactions which are destined to become habitual is insisted on. The profound influence of the parents in effecting repressions in the child and in establishing false emotional values is discussed, and the article concludes with a plea for a franker and broader education of the child in sex matters.

R. DANSIE.

- [141] **Childhood: the golden period for mental hygiene.**—WM. A. WHITE. *Mental Hygiene*, 1920, iv, 257.

MENTAL illness is a type of reaction in the individual to his problems of adjustment. It is conditioned by the nature of these problems and by his character-equipment. The second of these factors is the one to be studied, since mental hygiene is more capable of modifying it than the other. Descriptive and clinical classifications are discounted in favour of those of behaviouristic psychology based on the reactions of the individual as a whole from infancy onwards. Mental illnesses are thus found to be outward signs of intrapsychic difficulties or conflicts due to traits of character developed in childhood, which is therefore the ideal period for prophylactic treatment.

The author deprecates the undue value attached, in the past, to the germ-plasm theory of heredity, and the fatalistic type of thought resulting therefrom. He insists on the possibility of modifying to advantage inherited traits, in themselves to be deplored, and emphasizes the importance of environment in this connection. The necessary factors in prophylactic treatment are: (1) A sound behaviouristic child psychology; (2) An understanding of the child's relationships to its environment—especially to its own family; (3) The definite application of the above in education; (4) The application must be carried out both at home and at school.

Cases are quoted which illustrate the origin of offending traits of character in childhood. Existing child-welfare work is commended, but the author asks for a broad behaviouristic line of study carried through the periods of adolescence and early adult life. The article concludes that such a scheme would prove more workable than that of the eugenicist, which would merely control the material.

R. DANSIE.

- [142] **Some adaptive difficulties found in school children.**—ESTHER RICHARDS. *Mental Hygiene*, 1920, iv, 331.

THE article opens with a reference to a principle of education expressed by Adolf Meyer: "The highest aim of education will always lie in the proper encouragement and training of certain emotional assets, the interests, leanings and curiosities, ambitions, likes and dislikes, as well as of purely intellectual assets or knowledge." The writer carried out a series of observations, extending over fifteen months, in a chosen school. She gives characteristic examples of children revealing faulty psychological reactions, and a sketch of her mode of examination and treatment.

In discussing treatment of children showing retarded mental development, the author dwells on the necessity of separating them from normal children and of affording them individual attention in training. School hours should be spent in work which could be correlated with some activity possible for the child after leaving school. An extension of the school period is advocated, during which extension the child should be under the dual control of teacher and employer, thus being saved from the ranks of 'drift' labour.

A list of cases showing details of defects, treatment, and results in tabulated form concludes a concise account of a useful and interesting piece of work.

R. DANSIE.

- [113] The serpent as a symbol.—J. C. HASSELL. *Psycho-analytic Rev.*, 1919, vi, 296.

ANIMAL forms were doubtless first used in an animistic sense, and later became symbolic. Gradually the unconscious seized upon the animals as an expression of painful ideas in substituted acceptable form. From the study of mythology, folklore, and fairy tales, we find the symbolism is that of the unconscious of the race, and its meaning is therefore universal. This mostly holds good, too, in dreams, neuroses, and psychoses. Religion offers a fertile field for the play of symbolism, and the part of the serpent here is well known. This animal has been given many qualities and worshipped because of them. They may be grouped into five classes: wisdom (including powers of healing), guardianship and protection, paternity and transmigration, the command over fertility, and hostility. Illustrations are given of these various attributes. In the mentally diseased the serpent is common as a sexual symbol. It is a classical symbol of the male, the phallus, though in many cases it has also significance for the female. In the dreams of women the significance seems evident. Simple analysis of myths and legends unearths the sexual meaning of the serpent—the miracle of Moses, the fall of man, etc. This animal is also known as the God of Fire, and here we can recall that fire is the symbol of masculine sexuality (fire of passion). Interesting illustrations from clinical material of the serpent as a phallic symbol conclude the article.

C. STANFORD READ.

- [144] Contribution to the psychopathology of absence without leave and allied military offences (Zur Psychopathologie der unerlaubten Entfernung und verwandten Straftaten).—K. KLEIST and F. WISSMANN. *Allg. Zeits. f. Psychiat.*, 1920, lxxvi, 30.

THIS is a summary of observations made on soldiers tried for absence without leave, desertion, cowardice, or self-inflicted wounds; some were examined in field hospitals in Northern France and others in the Rostock clinic.

There were 54 cases in all, and of these only 5 showed evidence of gross mental disorder apart from mental deficiency, which latter affected 13 of them. The bulk of the report is taken up with descriptions of the 31



psychopaths among them, and of 6 cases in which 'nervous debility' seemed to be wholly due to war experiences.

The writers subdivide the psychopaths into: (1) Unstable psychopaths (4 cases); (2) Sensitive and emotionally labile psychopaths (4 cases); (3) Hysterics (7 cases); (4) Eccentrics (5 cases); (5) Anxious (ängstliche) psychopaths (5 cases); (6) Hypochondriacs (1 case); (7) Hypomaniaes (2 cases); (8) Cyclothymic (1 case); (9) Psychopaths with episodic irritability (2 cases). Members of the first group are characterized by an inability to settle down in civil life; they are either weak-willed and feeble, or restless natures. The cyclothymic is moody; the example described absented himself while in an irritable depressed state following a punishment. The last-named group comprises the poriomaniaes and dipsomaniaes.

On the whole psychopaths committed the lesser military offences, whereas cowardice and self-mutilation were often the crimes with which the war-neurotics were charged. These latter exhibited a fair family and personal record, had done well in long and bitter fighting, and had broken up. Characteristic of them was the conviction that they could no longer control themselves under shell-fire, and punishment had no corrective effect; they failed again in their next ordeal.

Of the above 37 cases, 28 were charged with absence without leave, 1 with cowardice, 4 with desertion, 3 with self-inflicted wounds.

According to these authors the underlying motives could be classed under the three headings of fear (23 cases), reluctance to serve (11 cases), and psychical states independent of external conditions (3 cases). This fear was not always fear of danger to life. Three cases absented themselves while awaiting punishment, another because he could not pay a debt. The remainder could not face their return to the dangers peculiar to war: only three of the number broke away actually from the trenches. The distinction between fright and anxiety (Angst) as causes is clearly brought out. Reluctance to serve was more frequent as a motive at the base, and among the unstable psychopaths and hysterics. Situation psychoses were not clearly the cause of military offences; when they did occur, it was in relation to the conditions following arrest.

The cases have been carefully worked out, and are described frankly and without sentimentality; in assessing responsibility less stress was laid on the actual examination of the individual than on the circumstances under which he failed, and on his previous history.

H. W. HILLS.

[145] The psychological analysis of superstition. — ALBERT K. WEINBERG. *Psycho-analytic Rev.*, 1920, vii, 31.

THIS study endeavours to demonstrate that an analogous symbolization to that seen in the dream is inherent in many superstitions or proverbial sayings of the masses. A long list of superstitions found among the Pennsylvania Germans is given, and, in view of the latent sexual content which analysis of them so frequently discloses, it is pointed out that these people are specially noted for their high morality. Thus, like the dream,

the superstitions embody a symbolization which is unconscious, and do not reflect upon the integrity of the total personality. The writer does not claim that all superstitions can be psychologically interpreted, for though very often illustrative of unconscious complexes, they are not invariably a product of the unconscious.

C. STANFORD READ.

[146] **Dreams** (Les rêves). BONJOUR. *Bibliothèque Univ. et Rev. Suisse*, 1920, xeviii, 203.

A BRIEF review of Freud's theory of dreams is given, and the abandonment of physiological for psychological hypotheses is deplored: though adult dreams often have their cause in infantile impressions, it is denied that they should be due to a developing sexual instinct, which is—according to the author—but ill-defined in childhood. He considers that dreams are the distorted reproduction of early stimuli and not of early emotions. Just as he explains individual adult dreams by external perceptions occurring in the immediate twenty-four hours or so preceding the dream, so does he ascribe the dreams of common type—such as Freud's 'flying dream', the falling dream, the dream of being confined in too small a space—to sensations perceived by the child in utero or at birth, sensations that, occurring in a state of semi-consciousness comparable to the hypnoid one, are particularly apt to remain fixed in subconscious memory.

For an instance he quotes the case of a little girl, one of four children, who was born in a state of partial asphyxia, and was the only one to have constant anxiety dreams, in which she pictured herself in a room too small for her in which she could not breathe. Again, he says that children born feet first are never subject to 'falling dreams' as are those that came into the world head first. He quotes the case of another child, born after obstructed labour, who constantly dreams of being in a long narrow corridor, the end of which seems terribly far, and oppressively small and constricted. He gives plentiful examples drawn from his own extensive practice, and after opposing psycho-analytic theories concludes that dreams do not contain the typical wish-fulfilment of Freud.

J. E. NICOLE.

[147] **Are there any instincts?** KNIGHT DUNLAP. *Jour. Abnorm. Psychol.*, 1919, xiv, 307.

ACCEPTING the conception of instinctive activities in general psychology as designating any responses which have not been learned, the author proceeds to deal with the conception of 'an instinct'. He finds that there is a great deal of confusion as to the exact meaning of the term. Some authorities, for example, restrict the term to groups of activities which are unconscious, while others insist on consciousness being one of the specific differentia of instinct. He sees, however, the gravest error to arise from the failure to distinguish between the instinct as a group of activities teleologically defined and the instinct as a physiological group. The activities of the feeding child may be considered physiologically as a separate group from any other physiological activities, or again may be considered

teleologically as a group of activities associated with the final result of obtaining food. The author permits the assumption that there are instincts in the physiological sense, but passes to doubt the existence of instincts in the teleological sense, i.e., the sense as inferred in McDougall's *Social Psychology*. He complains, in regard to the teleological groupings, that the classification is one merely of convenience: every author makes his own postulates, classifies his instincts accordingly, and then builds up his scheme of social psychology upon them. The author compares the construction of the social psychology in Trotter's *Herd Instinct in Peace and War*, in McDougall's *Social Psychology*, and in the Freudian system, in explanation of this point. Again, the importance of not considering the teleological classification of the instincts as more than a matter of convenience is shown by the overlapping of the instincts. As a matter of fact, there are very few responses of the animal which do not form part of a number of instincts, whatever be the classification. The same physiological activities, and even the same conscious processes, may be classed now as mere flight, now as a manifestation of gregariousness, now as self-abasement. The same fears, and perhaps the same desires, may be involved in several cases. He concludes that, accepting the term instinct in the sense in which it is most emphatically used at present, one must assume that for psychology there are no instincts. There is a great deal of instinctive activity, both conscious and unconscious, volitional and non-volitional, instinctive perceptions and thoughts no less than instinctive acts and emotions. He considers that the possibility of discovering a social psychology rests on the possibility of discovering a truly psychological grouping of instinctive activity, and that neither of these discoveries is likely to be made until we cease from talking of 'instincts'.

THOMAS BEATON.

- [148] **The localization of psychic functions** (Zur Frage der Lokalisation psychischer Funktionen).—FANKHAUSER. *Schweiz. med. Woch.*, 1920 1. 767.

FOLLOWING to a certain extent von Monakow and Berze, the author distinguishes functionally between the three outer cell-layers of the cerebral cortex and the three inner, or, rather, the two inner: for the purpose of his paper is to adduce evidence suggesting that the fourth or inner granular layer is associated with affectivity. It is absent in the motor area, where are placed only motor-images (engrams), and it is doubled in the visual cortex. An argument in favour of the association of a cortical layer with affectivity and against its local (regional) placing, is that there is no focal lesion of the cerebrum in which excitation or paralysis of affective phenomena is a constant occurrence, and this is true also of the basal ganglia. The moria (Witzelsucht) often found in frontal lesions is neither constant nor confined to that region. Disorders of the affective sphere are likely to occur only if the cortical lesions are sufficiently widespread and diffuse.

That the fourth layer should act as a unit is only conceivable if it be granted that other layers, individually or combined, should also

so act, e.g., those subserving ideation. The author suggests that the outer three layers are concerned with ideation, and the inner half of the cortex with perception, the latter being the site of the terminal fields of the various sense-avenues. According to von Monakow, the inner half of the cortex constitutes with its fibres a projection-apparatus, and the outer an association-apparatus. According to Berze, psychical processes cannot be localized focally; when motor or sensory phenomena appear in conjunction with localized lesions they are apsychie, and are the result of focal disturbances of the inner cortical layers. The suggestion is that the fourth layer is functionally linked with the outer three, forming the anatomo-physiological basis for the psychical processes of the affective sphere which accompany the reception of sensory stimuli and the carrying out of ideational stimuli. In these affective psychical processes are included consciousness of self, apperception, attention, and affect in the ordinary sense. Assuming this midway position for the affective sphere, the author considers the hypothesis will explain the genesis of hallucinations satisfactorily. The 'liveliness' of an idea is nothing else than its affective component. Intensity of the affect of an idea leads under pathological conditions to awakening of the corresponding sensory engrams of the inner layers and so to hallucinations.

In *perception* there is stimulation of sensory cortical fields (inner half) and spread of adequate innervation to the psychical layers: hence the idea of the perception, which is also, necessarily, linked in the process with an affective element. In the case of *ideation*, by association from memory there is reproduced something resembling an idea of a perception, also accompanied by an affective element, and, if the idea is 'lively', by slight stimulation of the sensory field from above. In *illusion*, sensory stimuli reach the sense fields and their engrams: for pathological reasons an inadequate innervation passes to the psychical outer half, and an imperfect idea of a perception results. In *hallucination*, there is awakening of a sense area by a pathological idea or an idea accompanied by a pathological affect.

The paper also contains useful comments on the question of the localization of the different varieties of apraxia and agnosia, but, regrettably, does not include references to the work of Shaw Bolton on the same subject.

S. A. K. W.

- [149] On the arbitrary use of the terms "masculine" and "feminine".  
—BEATRICE M. HINKLE. *Psycho-analytic Rev.*, 1920, vii, 15.

At a previous stage of human existence the term feminine had an entirely different connotation from what it has to-day, and the conception of the female as inferior was unknown among many peoples. Even now in many primitive races no such significance is attached to the sex. The European attitude, though not so freely expressed, is inclined to assume that feminine is synonymous with slave attributes and inferiority of soul. This view, the author thinks, originated gradually with the growth of the conception of individual property rights and the increase of power, which aroused the male desire to possess the women and children. The purchase followed the idea of possession, and as soon as women became sexually marketable



their freedom was doomed. Masculinity is associated with strength, aggressiveness, domination, and vigorous action in both the physical and intellectual spheres, while the feminine characteristics are presumed to be passivity, submissiveness, timidity, emotionalism, gentleness, and chastity, in fact, all those qualities with which we associate infantilism. When, however, the facts are examined, do men and women actually conform to this description? Dr. Hinkle thinks not, and believes that the actual distinctions between the sexes, other than their biological ones, can only be accurately gauged when the tradition of woman's inferiority has disappeared and the children of both sexes have the same training, freedom, privileges, and responsibilities. Sex differences in the animal world are referred to, and it is pointed out that therein there is no uniformity in these distinctions. Type differences are confused with those of sex.

In her psychological work the author has been constantly surprised to find the same reactions and tendencies in men as were supposed to be the sole possession of women, though often well concealed. This was found to be as true for the normal as for the neurotic. In endeavouring to live up to the collective conception of what should be their reactions according to their sex organs, much mental conflict may result. In women the struggle is not so much with the collective conception as is the case with man, but with the inner feeling which holds them in bondage. The masculine domination has forced her to repress, while man has been forced to express. Shell shock would never attack a natural fighting man whose instincts are aggressive. Changes in social conditions, aided by long periods of peace, have allowed men's interests to be occupied by peaceful pursuits which do not utilize the so-called masculine instincts, and so it is only those men who possess a strong instinct for power who are in the front ranks of war. It is not implied that there are no secondary characteristics which are determined by the possession of the distinctive sex organs, but at present we cannot truly evaluate them.

In discussing types, Jung's extroverted and introverted personalities are referred to at some length, with their characteristic reactions, in order to show where the error in the male estimate of the feminine sex has lain. The extroverted type is the typical male, aggressive, active, conquering, but there are many women with these same reactions. The introverted males are the ones who generally have a touch of the so-called feminine characteristics. Both psychological types were reduced in the female through restrictions. The introverted women could not develop their thought functions because their brains were deemed inferior, and so for all women the accent has been placed on the emotional side: the extroverted type were also handicapped because a childish attitude of dependency on man was insisted on. May it not be man's fear of the feminine principle itself which all unconsciously has driven the male to assume this superiority and to force woman into the rôle he wishes her to play? The real bondage is that of psychological type, and therefore, instead of demanding definite reactions according to sex, we must realize that normal functioning can only take place according to individual nature quite regardless of sex.

C. STANFORD READ.



## TREATMENT.

- [150] Some practical remarks upon the use of modified psycho-analysis in the treatment of borderland neuroses and psychoses.—L. PIERCE CLARK. *Psycho-analytic Rev.*, 1919, vi, 306.

IN commenting upon his experience in seven manic-depressives, Clark says he found it advantageous to sift the conscious and forceconscious settings of the patient's difficulties, and especially those which seemed to act as precipitating causes. A strictly psycho-analytic approach was only then taken up. The dream productions were found to be more on an adult level, and not so obviously latently sexual in interpretation as in the neuroses. Analysis could not be pushed to a finality so rapidly or completely either. What helped most in the periodic depressions was a more or less common-sense re-formulation of their attitudes toward their life problems. A psycho-analytic understanding of their emotional life was essential, as the innate trends of grit, courage, and perseverance were weak. In mental torticollis the individuals possess a very infantile emotional life, and through the weakness of their primary instincts the inversion required in psycho-analysis rendered them so impotent that a new attitude towards life had to be inculcated in order to obtain any satisfactory therapeutic results. In dementia præcox the mental deterioration is usually far too advanced when the patients apply for treatment, so that one can only use psycho-analytic teachings in helping them to adjust their lives, and any attempt at pure psycho-analysis in such cases invariably does harm by removing crutches by means of which they did in some way adjust to reality. A case of dementia præcox, then, should not be analyzed, but the individual may be helped by *conscious* suggestive therapeutics and rationalization to an adolescent sublimation of work, and recreation short of the adult demands of emotional maturity. In the borderland neuroses and psychoses psycho-analysis should be used with the greatest care, but its principles may be freely employed by the physician to enlighten his own mind upon the problems he has to help the patient to meet.

C. STANFORD READ.

- [151] Treatment of anxiety states by psycho-analysis (Du traitement des états anxieux par la méthode psycho-analytique).—TREPSAT. *L'Encéphale*, 1920, xv, 35.

Psycho-analytic technique in anxiety states (La technique de la méthode psycho-analytique dans les états anxieux).—DUPRÉ and TREPSAT. *L'Encéphale*, 1920, xv, 169.

ACCORDING to the authors a perfect psychotherapy for anxiety states does not exist at the present time. The method of 'rational persuasion' is sterile and practically useless, since the disease concerns the affective and not the cognitive aspect of the patient's mind. The method of emotional appeal may momentarily assuage mental pain, but it is necessary to go further than this, and explore his unconscious mind to find the origins of his trouble. By being shown the devious ways by which he has reached his condition, he has more power to readjust his judgements, his emotions, and his tendencies.

Morton Prince's objection to psycho-analysis is that it is no use bringing up the repressed material into consciousness, for the consciousness having repressed this very material in the past will simply do so again; but he makes the mistake, as does Janet, of regarding repression as a purely voluntary process, and forgets that pathogenic repression involves material of an intense emotional value. This is why sex so often plays a rôle in the genesis of the neuroses, for there is nothing so highly emotional or so closely interwoven with the personality of the individual. Further, because an idea or tendency has been repressed as insupportable at one time, it need not be insupportable when restored to consciousness by psycho-analysis, since by that time the circumstances are different. To demonstrate how these theories are applied, the analysis of a patient who suffered from pseudo-hallucinations accompanied by anxiety is given. The first clue was obtained from an outburst of emotion while discussing her relations with her husband. Next, the partial analysis of a dream, by free association from its incidents, indicated a repressed uneasiness with regard to her marriage. Next, by word association, various complex-indications were obtained, on associating from which 'love', 'brother', 'father', emerged as prominent motives, and a memory of the horror in which, as a child, she held the improper relations between her father and her governess. The same memory emerged at the next sitting from associations from a dream, and from these the connection between her regard for her father and the idea that she must respect him, her shame at his conduct, certain malpractices of her own induced by her phantasies of this conduct, and her scrupulous obsessions, were made clear. Further dreams elucidated an attachment to her grandfather and her identification of her husband with this grandfather. In short, all her obsessions and hallucinations were found by such methods to depend on early attachments and emotional conflicts, and the result of the self-knowledge thus gained by the patient was the disappearance of all her symptoms and her resumption of a normal life.

R. G. GORDON.

[152] **The methodological teachings and significance of psycho-analysis** (*Les enseignements méthodologiques et la signification de la psycho-analyse*).—M. R. MOURGUE and H. COLIN. *Ann. médico-psychologiques*, 1918, lxxiv.

In this criticism of psycho-analysis the authors seek to determine what is the essential characteristic of the method, and what deep need is responsible for the widespread diffusion of Freudian doctrine. They develop the view that psycho-analysis is a 'system'. By this term they mean a conception which is not necessarily foreign to concrete observation, but which is presented as having an absolute value, and with the help of which one could erect a complete system of pathology. In this instance the central notion is that of *pansexualism*. The 'libido' to the psycho-analyst is the same kind of 'maid of all work' as the term 'vital force' used to be in the old systems of medicine. Just as the old vitalists attributed to 'vital force' such and such attributes to 'explain' such and such groups of

phenomena, so Freud uses the expression 'libido' sometimes in a strict sexual sense, and sometimes in the sense of interest, sentiment, tendency, or instinct.

Criticism is also directed to the use of the term *censor*. In the opinion of the authors it is a dangerous principle to borrow a term from the social sphere, even though merely utilized as a comparison, and they point out that it is characteristic of German thought to make a frequent appeal to concrete comparisons, as, for instance, in the 'side-chain' theory of Ehrlich. They suggest that, however excellent such images may be in biological chemistry, it is far from being the same in a subject so obscure as psychopathology. There is a danger of thinking that one is dealing with an idea derived from experience, and which has no further need of being more thoroughly examined. The progress of a science begins when it begins to challenge the terms which it employs.

The contention is also made that the method of Freud is not truly objective, but is essentially one of subjective interpretation, and is philosophic rather than scientific. While the genetic method is excellent, as has been shown in other directions, the error in method of psycho-analysis, attaching to its character as a 'system', consists in the unilateral, pansexualistic interpretation of the phenomena analyzed.

The problem as to why Freudian doctrines have become so widespread is one of considerable complexity, and in this paper it is only considered from the point of view of the intellectual need which psycho-analysis appears to satisfy in the case of many neuropsychiatrists. It is suggested that for some years neurologists have felt the necessity of including a psychological approach to problems of the mind, and psycho-analysis has seemed to furnish for many a cut and dried psychology, which includes not only an 'explanation' of the obscure facts of psychopathology, but also a scientific psychotherapy.

Freud has made contributions of great interest in respect to symbolic thought, affective factors of mental life, wit, and dreams, but the tendency to develop a more objective psychology is becoming increasingly evident. The writers believe that the danger of 'systems' is more apparent than real, and that past experience has shown that they are destined to collapse when in contact with facts. Psychology, the need of which is felt to-day in the domain of neuropsychiatry, will only be solid in so far as it is erected patiently, in direct and daily contact with the clinic, for that alone represents reality in its infinite complexity.

II. DEVINE.

[153] Some notes on asexualization, with a report of eighteen cases.—  
MARTIN W. BARR. *Jour. Nerv. and Ment. Dis.*, 1920, li, 231.

The author points out that asexualization has been practised all through history, and that it is still met with even amongst civilized communities. Deprivation of the sexual glands by no means leads to mental and physical decay; on the contrary, many eunuchs have been noted for their intelligence and strength.

Mental defectives are notoriously deficient in control, and are therefore

more at the mercy of their lower impulses, including the sexual impulse. Any method of quieting the emotional excitation is always useful in the training of the mentally deficient, and the author suggests that asexualization would attain this end and at the same time diminish prostitution and general criminality, which are recruited so largely from the defective class.

In 1894, when Dr. Pilcher, of Winfield, Kansas, reported that he had operated on fifty-eight cases for asexualization, he was met with a howl of execration from the lay press. Recently, however, public opinion is gradually coming round to favour this procedure. It is recognized that this operation, while in no way interfering with health, abolishes sexual desire in the majority and reduces it in the rest. Six States of the Union have passed legislation authorizing this operation, but still well-meant sentimentality is permitting numbers of the less obvious deficiencies to escape into the world with their unbridled sexuality to propagate their kind and sap the strength of the nation. The operation of choice is castration in the male and oöphorectomy in the female, but vasectomy and fallocetomy may be substituted if there is a sentimental objection to removing the organs. Eighteen cases are described in which these operations have been performed, with lessening or abolition of sexual desire and practices and improvement in control of other undesirable impulses.

R. G. GORDON.

## Reviews.

**A General Introduction to Psycho-analysis.** By PROFESSOR SIGMUND FREUD, LL.D. Authorized translation with a preface by G. STANLEY HALL. 1920. New York: Boni and Liveright.

To give a lucid exposition of psycho-analytic doctrines in a comparatively small compass is by no means an easy task, but herein it is accomplished ideally. The book consists of a series of twenty-eight lectures which the author gave to a lay audience. It is written in almost conversational style, and though the subject must necessarily involve psychological matter that is more or less abstruse, Freud attacks the problems logically step by step, and so anticipates and answers the natural objections and difficulties which arise, that only the most obtuse could fail to follow his reasoning and recognize the justness of most of his conclusions. The essentials of the author's work are contained within these pages, except that his theory of wit is only referred to in a paragraph (p. 201), where he says: "The origin of wit lies in a forceconscious train of thought which is left over for a moment to unconscious manipulation, from which it then emerges as a joke."

Quite rightly the first section is devoted to the psychology of errors, because not only do the slips of everyday life especially appeal to all, but through the study of their mechanisms we get the simplest insight into unconscious motivation. The problems of the dream and its interpretation are dealt with in the second section, so that afterwards the pathology of the neuroses may be the more adequately understood. Sleep is regarded as a reversion to an intra-uterine state, and dream study is approached through the consideration of sleep-disturbing stimuli, day-dreams, and the suggested dreams of the hypnotic state. In order to reach the meaning of dreams, the manifest and latent dream content are differentiated, childhood dreams are dilated upon, and the factors of the dream censor, symbolism, and the dream work discussed, from which the conclusion is reached that the infantile dream is the obvious fulfilment of an admitted wish; the distorted dream is the disguised fulfilment of a suppressed wish; and the anxiety dream is the obvious fulfilment of a suppressed wish.

In the third section the general theory of the neuroses is admirably expounded. Through the study of the compulsion neurosis the unconscious is shown to exist, and it is demonstrated that not alone is the meaning of the symptoms invariably hidden in the unconscious, but that the very existence of the symptoms is conditioned by its relation to the unconscious. The other transference neuroses (anxiety hysteria, conversion hysteria) have their mechanisms explained in chapters on resistance and suppression; the sexual life of man: development of the libido and sexual



organization: theories of development and regression; the development of the symptom; ordinary nervousness; fear and anxiety; and transference. Many psycho-analytic disciples do not find it easy to grasp the conception that fear initiated at birth (toxic through interference with the circulation) is the prototype of all future fear, and that this birth trauma is so deeply ingrained in the human race that birth by Caesarean section makes no difference.

In the very excellent discussion on narcissism, which is looked upon as the libidinous complement of egoism, other mental disorders have fresh light thrown upon them. For some time it has been recognized that in dementia præcox the libido was turned back upon the ego, but the bringing of melancholia within the narcissistic fold will be added knowledge to many. Freud states that the self-accusations really apply to another, viz., the lost sex object or the sex object which has lost its value. The libido is withdrawn from the object, and by 'narcissistic identification' the object is built up within the ego itself, projected upon the ego. The personal ego is now treated in the same manner as the abandoned object, and suffers all the aggression and expressions of revenge which were planned for the object. Thus their suicide becomes more comprehensible, as the bitterness falls alike on the ego itself and the object of love and hate (ambivalence). The explanation given of the delusion of 'being watched' is interesting. In the ego there is an agent which continually watches and compares the other part of the ego and thus opposes it. The being spied on is therefore a truth, but it is not outside himself. A factor in his ego compares his actual ego and its activities to an ideal-ego that has been created in course of development. This ideal-ego is the conscience, the censor, and was built up to establish again the self-satisfaction which was bound up with the original infantile narcissism, but which since has had so many disparagements. When analyzed, the delusion of being watched is found to originate in the influence of parents, teachers, and society, and identification of the ego with certain of these models. Further study of the relation between the ego and sexual instincts will probably advance our knowledge of much that is at present obscure in mental disease. Certainly much remains to be done in this respect with the traumatic and war neuroses.

The concluding chapter is on analytic therapy, where it is shown that the aims are twofold: to force the libido of symptoms into transference, and then to set free the libido from this new object. Transference is, of course, a form of suggestibility, and according to Ferenczi is the essence of it; but Freud clearly points out how ordinary and hypnotic suggestion differ from the suggestive factor in psycho-analysis.

Neurologists of the materialistic school will be gratified to learn that Freud tends to lean toward a toxic etiology for the true neuroses, and wonders whether these neuroses are not disturbances of sexual metabolism, whether perhaps in some way more sexual toxins may be produced than the individual can dispose of, or that psychic conditions prevent their proper elaboration. He actually goes so far as to say: "The structure of psycho-analysis that we have erected is really only a superstructure which

at some future time must be placed upon its organic foundation ; but what this is we do not know as yet."

It must be noted that Freud now uses the terms 'repression' and 'suppression' in the same sense. This is somewhat to be deplored, since it seems distinctly useful to use them as signifying two different psychological processes. The term 'suppression' is conceived of differently by many psycho-analysts, but it seems convenient to employ it only in relation to the conscious and foreconscious systems. Much misunderstanding arises from the varying conceptions of terms employed in psycho-analytic literature, and one wishes therefore that the author had been more explicit on this point. He defines repression (p. 254); later (p. 256) he gives suppression the same meaning, and afterwards only uses the latter term. One is surprised, too, that the term 'complex' is used (p. 86) without any definition of its meaning. Many errors exist which should be corrected in a future edition. On p. 353, line 27, "fear into libido" should read "libido into fear". The name Siebault is given (p. 81), which evidently refers to Liébeault of Naney. Why, too, do we have the spelling 'narcism' and 'saddism' instead of 'narcissism' and 'sadism'?

The book nevertheless is admirable, and supplies a much-needed want. No other general work on psycho-analysis can compare with this for lucidity, and, though primarily intended for lay readers, it should be read by all physicians who wish to orientate themselves on this important subject; and those who already have some knowledge will find these pages very well worth study.

C. STANFORD READ.

**Feeble-mindedness in Children of School Age.** By C. PAGET LAPAGE, M.D. With an Appendix on Treatment and Training by MARY DENDY, M.A. Second edition. 8vo. Pp. 309. 1920. Manchester: University Press. London: Longmans, Green & Co. Price 10s. 6d net.

THIS is the second edition of a book first published ten years ago. The preface suitably describes it as written for school medical officers, teachers, and workers.

A history is given in the first chapter of the movement to provide accommodation in institutions for idiots and imbeciles, and important facts and opinions brought forward during the proceedings of the Royal Commission of 1904-8 are mentioned, as well as the salient features in the report of the Commission. Dr. Francis Warner's investigation of 1892 is quoted, with his conclusion that one per cent of those school children examined required special care and training, which is a figure that closely approximates to the actual number ascertained during the last few years by the local authorities who have carefully inquired into the matter in their own areas.

Following this historical sketch is a useful chapter containing lists of the various regulations and circulars that have been issued relating to the Mental Deficiency Act, but, although the book was published as recently

as August, the list cannot be said to be up to date. Some of the paraphrased sections of the Act and Regulations are not clear; e.g., the last paragraph but one on page 35 presumably refers to approved homes, but does not so describe them, while on page 40 the reference to petitions seems to confuse two distinct methods of procedure, viz., that under Section 6 and that under Section 3. The use of the terms 'voluntary' and 'compulsory' in this connection does not correctly describe the procedure.

There is, however, much useful information here for those for whom the book is written, and the chapter in question contains a timely warning against entertaining a belief in the advantage of special school training that lacks the opportunity of subsequent permanent care of the patient in a colony or under other suitable conditions, and the wise conclusion is reached that "only a small proportion of defectives are really better under guardianship". In later chapters the defective child is described, and much attention is given to the deformities that constitute stigmata, and to the varieties and treatment of speech defect: workers are likely to find the latter of considerable help. The difficulties of examining the mentally defective deaf are also treated in some detail.

Together with the mental characteristics of the feeble-minded the various special types are described with clearness, but one regrets to see a suggestion that the moral imbecile shows of necessity some defect of intelligence, as though 'mental' were identical with 'intellectual' defect.

Some pages are devoted to the relation of heredity and other factors in the production of feeble-mindedness, and the theory is advanced that variation and not mutation is the causative factor. The influence of alcohol in this respect is discussed at some length, and the opinion is stated that this and other intoxications or toxins act as accessory or determining factors in a stock already tainted.

In the chapter on preventive measures the necessity of life-long care is emphasized, and the deterioration that follows when trained defectives cease to enjoy supervision is pointed out. The various courses open to parents to secure proper treatment for defective children are mentioned, and the principles of the management of such patients are but briefly indicated in view of the full appendix on this subject written by Miss Dendy; those who have charge of the feeble-minded cannot fail to find invaluable help in this appendix, and its suggestions and injunctions ought to be brought to the notice of all who are responsible for the management of defectives in institutions. Miss Dendy, from her close and able observation of the feeble-minded over a long period, points out that the keynote of success in dealing with them is occupation, which must be carried on under conditions of kindly encouragement and strict supervision. The Home at Sandlebridge is described, and many extremely useful details of equipment are furnished.

Other appendices describe details of examination, such as head measurement and speech.

A. E. E.

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# THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

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## Original Papers.

### HYDROCEPHALUS COMPLICATING CEREBRO- SPINAL FEVER, AND ITS TREATMENT.

BY CECIL WORSTER-DROUGHT, LONDON.

IN cerebrospinal fever two types of hydrocephalus are met with:  
(1) *Generalized Hydrocephalus*; (2) *Internal Hydrocephalus*.

**I. Generalized Hydrocephalus.**—Generalized hydrocephalus is that type in which an increased amount of cerebrospinal fluid is present throughout the subarachnoid space, both in the ventricles and externally, without obstruction of the foramina of Magendie and Luschka.

In addition to that occurring early in the disease, generalized hydrocephalus may develop at any time subsequent to the first week. The characteristic symptoms are practically those of internal hydrocephalus but in a somewhat less severe form—headache, lethargy, vomiting, tremulousness, and dilated pupils; the temperature usually rises, but may remain at its previous level. When there is a considerable accumulation of cerebrospinal fluid under increased pressure throughout the subarachnoid space, and no meningeal adhesions interrupt the continuity of the latter, lumbar puncture yields a large quantity of cerebrospinal fluid. The evacuation of this affords considerable relief, but it may be necessary to repeat the operation every twelve hours before the hydrocephalus has definitely passed off. In other instances, however, in spite of repeated lumbar puncture, death may result from hydrocephalus, generalized as regards the cranial cavity, and due to a blockage occurring either at the foramen magnum or in the spinal canal above the region of lumbar puncture. For



example, the following case proved fatal owing to fibrinopurulent exudate producing almost complete obstruction at the upper extremity of the spinal theca, in the region of the foramen magnum.

**Case 1.—Generalized Hydrocephalus of the Cranial Subarachnoid Space, due to Obstruction at the Foramen Magnum.**—For a month prior to coming under our observation, the patient, age 18, had been in hospital elsewhere suffering from pyrexia of obscure origin which was apparently ascribed to 'rheumatism'. The history given by the patient was that he complained of severe headache and 'pain all over'. The only record of his illness obtainable was the temperature chart, which showed an irregularly intermittent pyrexia varying between subnormal and 103°—extremely suggestive of cerebrospinal fever. The rises in temperature had persisted for sixteen days; following this the pyrexia subsided. Throughout this period the pulse-rate had remained below 96 per minute, varying between this figure and 60. The patient had then been kept in bed for a further five days (21st day of illness), and was finally discharged from hospital eleven days later (32nd day).

The patient stated that on leaving the hospital he still felt far from well. Two days later he commenced shivering, complained of headache during the afternoon, and vomited in the evening. He was then sent to hospital, being admitted as a case of influenza. No improvement in his condition was noticed, however, and two days later (3rd day of 'second attack' and 38th day of total illness) he came under my observation. The temperature was then 101°, pulse 80, and all the usual signs of meningitis were well marked: he answered questions well, but at times was inclined to become incoherent. Lumbar puncture yielded a slightly turbid fluid containing meningococci.

Daily lumbar puncture and serum administration were instituted, fair quantities (40 to 60 c.c.) of cerebrospinal fluid being obtained; the colour of the latter, however, tended to become an increasingly deep yellow (xanthochromia). For the first two days little or no change occurred in the patient's general condition. His subsequent progress was as follows:—

*Sixth day* (41st day of total illness).—The patient was distinctly delirious and exhibited incontinence of urine. On being roused, however, he spoke fairly rationally, stating that he had absolutely no headache. As he was inclined to be tremulous, hydrocephalus was feared to be developing: lumbar puncture was therefore performed both morning and evening.

11 a.m. L. puncture: 60 c.c. Slightly turbid yellowish fluid.

11 p.m. L. puncture: 60 c.c. Slightly turbid yellowish fluid.

(No increased pressure was apparent.)

*Seventh day* (42nd day of total illness).—Delirium persisted, but incontinence was absent. Occasional floccitation was present. Profuse sweating was a marked feature, being so intense as to necessitate changing the bedclothes several times. The pupils were dilated and the arms tremulous.

11 a.m. L. puncture: 60 c.c. Slightly turbid yellowish fluid.

11 p.m. L. puncture: 40 c.c. Slightly turbid yellowish fluid.

The fluid trickled only very slowly through the needle; on each occasion the needle was withdrawn and re-inserted in a different interspace, with no better result. 30 c.c. of antimeningococcal serum were administered at the morning puncture.

*Eighth day* (13rd day of total illness).—Delirium increased, and incontinence again made its appearance. No sweating occurred, but the pupils were very dilated and tremulousness was pronounced. Definite strabismus was observed.

10 a.m. L. puncture: 10 c.c. Deep yellow fluid.

10 p.m. L. puncture: 5 c.c. Deep yellow fluid.

On each occasion the fluid was obtained only with difficulty; several interspaces were entered, the flow being very slow.

*Ninth day* (14th day of total illness).—The patient died somewhat suddenly during the early hours of the morning.

**AUTOPSY.**—The dura mater was found tense, and on incising it a large quantity of slightly turbid fluid escaped. Over the convexity of the cerebrum there was practically no meningitis. At the base, however, tough fibrinopurulent exudate was found over the pons, medulla, and cerebellum, extending as far forwards as the optic chiasma. The exudate also extended downwards to the cervical region of the spinal cord, the spinal canal at the foramen magnum being almost completely occluded. The lateral ventricles were only moderately distended with slightly turbid fluid.

Occasionally, adhesions between the parietal and visceral arachnoid of the spinal cord may bring about a generalized hydrocephalus similar to that described above. In a case mentioned by Foster and Gaskell<sup>1</sup> death resulted from this cause.

In chronic cases of cerebrospinal fever, generalized hydrocephalus is occasionally found to persist even after apparent recovery from meningitis. This result, no doubt, is due to organized exudate and adhesions of the pia-arachnoid diminishing the total capacity of the subarachnoid space, and also, possibly, to some extent limiting the absorption of cerebrospinal fluid. Cases, usually in children, may come under observation and, on examination, suggest a condition of hydrocephalus. A history may be obtained of an obscure illness, accompanied by headache and vomiting, some weeks or even months previously, from which the patient was supposed to have recovered. On lumbar puncture a clear fluid will usually be obtained. Such a condition is really a chronic meningitis following an acute attack of cerebrospinal fever from which the patient merely appears to have recovered; some of the so-called relapsing cases are probably of this nature.

**II. Internal Hydrocephalus.**—Under normal conditions, the cerebrospinal fluid secreted by the choroid plexus into the lateral ventricles passes from there into the fourth ventricle, and thence to the subarachnoid space through the median foramen of Magendie and the two lateral foramina of Key and Retzius or Luschka. According to Merkel, the lateral ventricles also communicate with the subarachnoid space at the apices of their descending horns.

When, owing to inflammatory changes, complete or partial occlusion of the foramina of Magendie and Luschka occurs, the

cerebrospinal fluid, being unable to escape through its usual channels, accumulates in excess throughout the ventricular system. Consequently, since normal absorption is only possible from the subarachnoid space, a condition of dilatation of the ventricles results.

Internal hydrocephalus is not invariably due to the mechanical closure of the foramina of Magendie and Luschka. It may arise, even in posterior basic types, without occlusion of these orifices, owing to the lack of mechanical resistance offered by the ventricular walls to the total increase of fluid and internal pressure. The softening of the tissue surrounding the ventricles by œdema, and often by actual inflammation, facilitates such a procedure to a considerable extent. This factor, however, is probably of greater importance in patients where hydrocephalus occurs comparatively early in the course rather than in chronic cases.

Dandy and Blackpan<sup>2</sup> have shown clinically that phenolsulphonaphthalein, when injected intraventricularly, is excreted in the urine in small amounts where internal hydrocephalus exists. Experimentally, the same observers have produced internal hydrocephalus by (1) the mechanical blockage of the aqueduct of Sylvius, and (2) low ligation of the vena Galeni magna: high ligation had no such effect. Clinically, therefore, it is possible for either blockage of the Sylvian aqueduct by purulent exudate, or thrombosis of the vena Galeni, to produce internal hydrocephalus; as far as I am aware, however, the latter condition, originally suggested by Carr<sup>3</sup> in 1897, has not been demonstrated at autopsy, but Foster and Gaskell mention one case exhibiting, on post-mortem examination, well-marked hydrocephalus of the lateral and third ventricles, the latter being completely blocked.

Most authorities consider that internal hydrocephalus, once definitely established, is invariably fatal, apart from operative procedures. When the occlusion of the ventricular outlets is complete and permanent, death of course would be the only possible termination. Naturally, a diagnosis of internal hydrocephalus is always open to suspicion in cases recovering, as the condition is not confirmed by autopsy. Nevertheless, a case may present all the typical signs of internal hydrocephalus, including 'dry punctures', and yet recover.<sup>4</sup> Post mortem, as already mentioned, complete obliteration of the foramina is rarely found. It is fair to assume, therefore, that in the majority of cases of internal hydrocephalus, the interference with the outlets stops just short of complete occlusion. Early recognition of hydrocephalic symptoms and treatment by repeated lumbar puncture may often prevent the hydrocephalus from becoming entirely internal. As Foster and Gaskell point out, the effect of the puncture may gradually lessen the maximum tension below a

certain critical point at which normal drainage is able to take place. Following a period of serum administration, treatment by repeated daily lumbar puncture, as described elsewhere,<sup>5</sup> tends to avert the development of internal hydrocephalus. When, however, the amount of cerebrospinal fluid obtained progressively diminishes and reaches the stage of 'dry punctures', other methods of treatment, which will be described later, have to be considered.

**TREATMENT.**—The generalized hydrocephalus occurring in the early stages of meningitis, which is responsible for such symptoms as headache, vomiting, stupor, and, in children, bulging of the anterior fontanelle, is relieved by the lumbar puncture preliminary to the first intrathecal injection of serum. As much cerebrospinal fluid as possible should be withdrawn.

The importance of the early recognition of hydrocephalic symptoms developing later in the course cannot be sufficiently insisted upon. Speedy and repeated lumbar puncture, performed twice daily if necessary, will often avert a chronic condition. Continued daily lumbar puncture, following the period of serum administration, largely counteracts any tendency towards the development of hydrocephalus; nevertheless, symptoms of this complication occasionally occur. Continued lumbar puncture, however, will often bring about complete relief, as, for example, in the following case:—<sup>9</sup>

*Case 2.*—A subacute case, age 29, and not received until the fourteenth day of illness, was given antimeningococcal serum in 30-c.c. doses each day for eight days. For two days following this, only small amounts (5 to 10 c.c.) of cerebrospinal fluid were obtainable on lumbar puncture; as a result, the patient developed symptoms of hydrocephalus—apathy, vomiting, incontinence, tremulousness, dilated pupils, and marked head retraction. No organisms were visible in the cerebrospinal fluid or obtainable on culture. With repeated daily lumbar puncture, however, larger quantities of fluid (50 to 70 c.c.) were gradually obtained, and the hydrocephalic symptoms disappeared. The patient was punctured on nine successive days, following the termination of serum administration, before a perfectly clear cerebrospinal fluid was withdrawn. The total course of illness amounted to thirty days.

In a few cases symptoms of hydrocephalus may appear in spite of the fact that fair quantities of cerebrospinal fluid are withdrawn daily. When this occurs, lumbar puncture should be performed both morning and evening until the hydrocephalic symptoms have disappeared; if the cerebrospinal fluid is only slightly turbid and no organisms have reappeared, serum administration need not necessarily be resumed.

Occasionally a hydrocephalic case of chronic meningitis may come under observation in which it is impossible to find any organisms in the cerebrospinal fluid, either on direct examination or on culture.



The fluid may be clear to the naked eye, and the cytological characters resemble those found in tuberculous meningitis, viz., the number of mononuclear cells far exceeding that of the polymorphonuclears. If the case, for some reason or other, does not appear to be typical of tuberculous meningitis, e.g., owing to the history of onset or the appearance of well-marked muscular rigidities, the exhibition of anti-meningococcal serum, administered intrathecally for twelve daily doses, followed by continued lumbar puncture for some days, is well worthy of trial. I have met with two such examples. One case of chronic meningitis, that of a man, age 35, who had been given a practically hopeless prognosis, made a complete recovery, and has been recorded elsewhere.<sup>6</sup>

The details of the second case are as follows :—

**CASE 3.—HISTORY PRIOR TO ADMISSION.**—The patient, a man, age 39, was first seen on May 5. The history was that during the previous February he had a bad attack of 'influenza', and after about four weeks was able to get up and go about in a very listless fashion. During April he became steadily worse, being apathetic and at times losing consciousness. He had in turn been regarded as a case of encephalitis lethargica, cerebrospinal syphilis, and (?) tuberculous meningitis.

**CONDITION ON ADMISSION.**—The patient was profoundly emaciated and appeared very deaf; he was apathetic, but resentful of interference, and answered questions incoherently. The limbs were kept in an attitude of flexion, and he exhibited general hyperaesthesia. Temperature, 99·6°; pulse-rate 82. Pupils were dilated, but reacted sluggishly to light; beyond the deafness, the other cranial nerves were normal. Neck rigidity well marked, but without definite occipital retraction. Kernig's sign was positive on the right side but negative on left; on this latter side, however, there was pronounced rigidity of the iliopsoas muscle. Both knee-jerks brisk; right ankle-jerk brisk, left sluggish. The plantar reflexes were flexor, and the abdominals sluggish but equal. Incontinence of urine and faeces.

On lumbar puncture, the cerebrospinal fluid was under increased pressure, yellowish in colour, and, on examination by Dr. Braxton Hicks, exhibited 1100 cells per c.mm., 50 per cent being polymorphonuclears and 50 per cent mononuclears. The globulin reaction was markedly positive, and the Wassermann and glucose reactions were negative: no organisms were visible on microscopical examination, and cultures remained sterile.

**TREATMENT AND PROGRESS.**—The patient was given ten consecutive daily doses of anti-meningococcal serum (Types I, II, and III pooled) and polyvalent vaccine, in increasing doses from 250 million to 2500 million organisms, every four days. The cerebrospinal fluid examined on the tenth day of treatment showed only 112 lymphocytes per c.mm. Following the cessation of serum administration, lumbar puncture was repeated daily for ten further days. The patient rapidly put on flesh, sphincteric control was regained, neck rigidity gradually diminished, and Kernig's sign became negative. By May 26, the day following the last lumbar puncture and that on which the last dose of vaccine (2500 million) was administered, the deafness had greatly improved; the patient's mental condition was normal, and physical signs were practically absent. He got up from



bed on June 12, and on June 28, a few days before leaving hospital, lumbar puncture was performed and the cerebrospinal fluid examined, with the following result: Fluid clear to the naked eye, 5 lymphocytes per c.mm., glucose reaction positive, globulin negative, cultures sterile.

If symptoms of internal hydrocephalus appear—lethargy, incontinence, persistent vomiting, tremulousness, general hyperæsthesia, dilated pupils, and possibly nystagmus—and no fluid can be obtained on lumbar puncture, treatment can only be effective if directed to the drainage of the subarachnoid space above the site of obstruction. A 'dry tap' on lumbar puncture should not be diagnosed unless the spinal canal has been entered in at least three different intervertebral spaces. The obstruction may occur in the dorsal region of the spinal canal, the upper portion of the spinal subarachnoid space being thus shut off from the lower; under these circumstances, dorsal puncture may be successful, but if no fluid is obtained, cervical puncture should be tried. Unfortunately, above the level of the 11th dorsal vertebra there can be no absolute certainty of the presence of a posterior subarachnoid space. In a series of 11 dissections, Lusk<sup>7</sup> found that in only 3 was there present a complete posterior subarachnoid space above the level of the *conus medullaris*; even in these 3 instances interrupting transverse septa occurred at intervals, so that the posterior channel was not continuous. Free circulation of cerebrospinal fluid, however, was allowed by means of the lateral communications with the anterior part of the space through the *ligamentum denticulatum*. In the remaining 8 dissections, adhesions existed at various sites between the spinal cord and the posterior portions of the arachnoid. The adhesions extended downwards to a distance varying from the level of the 5th thoracic vertebra to two inches above the *conus medullaris*.

It will be seen, therefore, that even if the obstruction be present in the spinal canal, dorsal or cervical puncture will not necessarily give the desired result. Cervical puncture is usually more successful than dorsal. The technique is as follows: The patient is maintained in the left lateral position, with rounded spine, and the interspace between the 6th and 7th cervical vertebrae is defined; in the case of dorsal puncture, one of the mid-dorsal interspaces is selected. The needle is then directed in the mid-line from below upwards, following the axis of the interspinous spaces. As soon as the skin is penetrated, the stylet is removed from the needle in order that the cerebrospinal fluid can escape directly the point has reached the subarachnoid space, injury to the spinal cord thus being avoided.

Cases in which cervical puncture was performed and serum injected in the same situation, followed by recovery, have been reported by Cantas and Gerard. Ravaut and Kranitski applied

the same methods in suitable cases, but experienced difficulty in withdrawing a sufficient quantity of cerebrospinal fluid from the dorsal region: also, each fresh injection of serum was followed by epileptiform seizures. In the cervical region, however, fluid was readily obtained.

The following example illustrates a case of my own in which cervical puncture and the injection of serum was successful, the patient recovering:—

*Case 4.*—The patient, age 27, was taken ill suddenly with headache, a feeling of soreness in the throat, and vomiting. He was admitted to hospital, but apparently showed some improvement by the following day, as it was considered that he was suffering merely from 'tonsillitis'. He remained in bed, however, and continued to complain of headache and general malaise; a record of the temperature and pulse-rate during the earlier period was unobtainable. Seventeen days after his admission to hospital he suddenly became very restless, and within a few hours was profoundly delirious; it was then that the case came under our observation. On examination the condition was as follows:—

Mental condition one of stupor with occasional delirium. Temperature  $102.8^{\circ}$ , pulse-rate 92, respirations 36. Pupils somewhat dilated, and reacting sluggishly to light. Well-marked neck rigidity, with slight occipital retraction; Kernig's sign positive; knee- and ankle-jerks slight, and abdominal very sluggish.

Lumbar puncture was performed, and 50 c.c. of turbid cerebrospinal fluid evacuated; 30 c.c. of polyvalent antimeningococcal serum were at once injected intrathecally. It was considered that the case was one of cerebrospinal fever of the recrudescence type, the day of the recrudescence being the 17th day of total illness. Subsequent examination of the turbid cerebrospinal fluid removed, showed the presence of numerous polymorphonuclear leucocytes, and both intracellular and extracellular meningococci. Cultivations yielded a meningococcus corresponding with Gordon's Type III.

The daily intrathecal injection of serum was continued, and the patient progressed satisfactorily up till the fifth day of treatment (21st day of total course), when great difficulty was experienced in obtaining fluid by lumbar puncture, no less than three interspaces being entered before 18 c.c. could be removed; this quantity was replaced by an equivalent amount of Type III. serum (as by this time the type had been identified).

On the following two days (22nd and 23rd days of illness and sixth and seventh days of treatment) the patient was inclined to be delirious, and exhibited floccitation and carphology; on lumbar puncture, cerebrospinal fluid escaped very slowly, drop by drop. On the 24th day (eighth day of treatment) the patient was considerably worse, being quite delirious and exhibiting incontinence of urine and faeces. No fluid could be obtained on lumbar puncture (three interspaces being entered) or dorsal puncture (two interspaces). Consequently, cervical puncture was resorted to and 40 c.c. of slightly turbid yellowish fluid were easily removed; 30 c.c. of Type III serum were injected very slowly by the gravity method. Next day (25th) the patient was somewhat better, being less delirious and not exhibiting carphology. Cervical puncture was again performed, and 30 c.c. of serum injected. Both this fluid and that of the previous day showed a

few meningococci. On the 26th day the patient was considerably better, answering questions fairly well, exhibiting slight delirium only at intervals, and incontinence was absent. Ten c.c. of fluid were obtained on lumbar puncture, but as this quantity was considered insufficient, cervical puncture was performed, resulting in the removal of 40 c.c. further of fluid: 30 c.c. of serum were injected in the same situation. Neither sample of fluid showed meningococci, either on direct examination or in culture. On the following day (27th day of illness and eleventh day of treatment) 35 c.c. of slightly turbid yellowish fluid were obtained on lumbar puncture but no serum was injected; next day (28th) the patient's mental condition was apparently normal, and 35 c.c. were again removed by the lumbar route. From this time onwards the patient rapidly improved, the temperature reaching normal on the 31st day; lumbar puncture was repeated daily up till the 33rd day (seventeenth day of treatment and seventh day after cessation of serum administration), when the cerebrospinal fluid was quite clear and all symptoms were absent.

Vaccine was administered from the third day of treatment (19th day of illness) every fourth day in increasing doses from 500 million organisms to 2500 million; at the third dose, polyvalent vaccine was replaced by Type III vaccine.

In the above case, it is probable that inflammatory adhesions were forming in the spinal subarachnoid space in the dorsal region; the intrathecal injection of serum apparently led to the inhibition of the adhesion formation and the ultimate subsidence of the inflammatory changes.

If lumbar, dorsal, and cervical punctures are all unsuccessful in yielding cerebrospinal fluid, it is still possible that generalized hydrocephalus exists, obstruction having occurred at the foramen magnum owing to the accumulation of fibrinopurulent exudate (e.g., Case 1). Consequently, before proceeding to tap the lateral ventricles, sphenoidal puncture, after the method of Bériel and Cazamian, should be tried. The technique is as follows:—

A pointed needle, fitted with stylet (e.g., an ordinary lumbar-puncture needle), is introduced at a point 2 mm. external to the supraorbital notch; it is pushed slightly upwards and inwards to reach the bony vault of the orbit. The sharp stylet is now withdrawn from the needle, and replaced by a blunt one reaching just beyond the point of the needle; with a little manipulation the most external portion of the sphenoidal fissure is reached and a fibrous membrane pierced with the characteristic sense of resistance. The stylet is then withdrawn, and cerebrospinal fluid escapes if the hydrocephalus be generalized in the cranial cavity. After removal of a sufficient quantity of cerebrospinal fluid, antimeningococcal serum may be slowly injected by the gravitation method. Cazamian<sup>8</sup> applied this method of serum injection to three cases, two of which were *in extremis* and proved fatal; the third case, however, recovered.

When the above methods of puncture fail to yield cerebrospinal

fluid in the presence of hydrocephalic symptoms, the only treatment that can be successful is drainage of the ventricles. In infants, the puncture is easily performed through the anterior fontanelle, the method being as follows :—

The upper part of the scalp having been shaved and the skin sterilized, the anterior fontanelle is defined and an ordinary lumbar-puncture needle with stylet placed at the lateral angle—that is, about 1 in. ( $2\frac{1}{2}$  cm.) from the mid-line. The needle is pointed in a direction downwards, slightly backwards and inwards, and is pushed in to a depth of about  $1\frac{1}{4}$  in. (3 cm.). When the ventricles are very dilated and the cerebral cortex thinned, the needle entering in almost any direction will usually strike fluid.

The operation is usually well borne, and the amount of shock small. There are two possible dangers—injury to vital centres, and hæmorrhage. The risk, however, is very slight, and the gravity of the condition warrants the procedure.

At the first operation cerebrospinal fluid should merely be withdrawn. If this fluid reveals no meningococci either on direct examination or culture, subsequent punctures should consist in the simple removal of fluid. If, however, the fluid proves to be infected, serum should be injected, the administration being carried out in the same way as in intraspinal injection and the same precautions observed. The amount of fluid withdrawn should, of course, be considerably less than the quantity of serum administered. Both ventricles are tapped, preferably on alternate days; if puncture be confined to one ventricle, the drainage of the other is incomplete.

In older children and adults, trephining is necessary. Two methods are available :—

1. *Keen's Method*.—The trephine opening is made at a point  $1\frac{1}{4}$  in. (3 cm.) above the external auditory meatus; this site corresponds with the posterior end of the temporal line, and is known as Keen's point. In performing the puncture, the needle is directed towards the upper limit of the opposite pinna. At a depth of about 2 in. (5 cm.), the lateral ventricle will be entered at its widest part, that is, where the lateral and posterior horns are given off from the body at the posterior end of the optic thalamus. The most dependent part of the ventricle is tapped by this method, thus affording more adequate drainage than if it were entered from above.

W. J. Denchy<sup>9</sup> found that, in nine cases coming to autopsy, the lateral ventricles having previously been tapped by Keen's method, no damage to the brain substance had occurred. In each case the puncture pierced the most dependent part of the lateral ventricle. The slightly blood-stained needle track was easily identified, but even in the case of multiple puncture there was no serious damage

to the brain. In one case a blood-clot lay extradurally immediately within the skull, due to the accidental rupture of a vessel.

2. *Kocher's Method*.—A point 1 in. ( $2\frac{1}{2}$  cm.) from the mid-line and about  $1\frac{1}{2}$  inches (4 cms.) anterior to the bregma, is taken as the situation for performing the trephine. In puncturing, the needle should be directed downwards and backwards; the ventricle will be reached at a depth of  $1\frac{1}{2}$  to 2 in. There is practically no risk of hæmorrhage during the passage of the needle.

More recently, instead of trephining, I merely drilled a hole through the skull over Keen's point and punctured the ventricle through the small opening thus made. It is possible to perform the operation under local anæsthesia, the 'shock' being negligible compared with that resulting from a trephine, and drainage appearing equally effective. The only risk is that of damaging one of the cortical vessels.

Whichever of the above methods be adopted, one side should be operated upon first and the other subsequently. When internal hydrocephalus is present, the dura is found tense and non-pulsating. On withdrawing the stylet from the puncture needle, the fluid usually appears with force and should be allowed to escape until the flow ceases.

Stetten and Roberts<sup>10</sup> advocate incision of the corpus callosum, and the production of a wide opening which allows of prolonged drainage; a successful case is recorded.

Unfortunately, it cannot be claimed that ventricular puncture in internal hydrocephalus of adults is a striking success, since recoveries are relatively few. Nevertheless, excepting in very rare cases, the operation offers the only chance of avoiding a fatal issue.

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- <sup>3</sup> CARR, *Med.-Chir. Transac.*, 1897, lxxx, 303.
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- <sup>5</sup> WORSTER-DROUGHT, *Jour. Neurol. and Psychopathol.*, 1920, i, 11.
- <sup>6</sup> WORSTER-DROUGHT and MILLS KENNEDY, *Cerebrospinal Fever*, 1919, 412.
- <sup>7</sup> LUSK, *Ann. of Surg.*, 1911, liv, 449.
- <sup>8</sup> CAZAMIAN, *Bull. gén. de Therap.*, Paris, 1915-16, clxxviii, 293.
- <sup>9</sup> DENEHY, *Brit. Med. Jour.*, 1916, ii, 684.
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## NOTES ON THE ANALYSIS OF A CASE OF MELANCHOLIA.

By ALFRED CARVER, BIRMINGHAM.

ALTHOUGH much interesting work has been done in elucidating the psychic mechanism in paranoia, relatively little attention has been given to melancholia.\* The following notes upon the analysis of a case indicate that in the melancholic we have to do with a mental mechanism which is almost the direct converse of that exhibited by the paranoic.

The subject of this analysis was a woman, age 44. She had always lived a cramped, uneventful suburban life. After marriage at 24 she continued to live within a few minutes' walk of her old home. Her mother died suddenly when the patient was 38. This came as a great shock to her, as the mother had until her marriage been the dominant factor in her life, and even after had continued to secure for her those amenities which she had been too unenterprising to gain for herself. The patient and her husband then went to live at the paternal house, where she acted as housekeeper. Three years later her husband developed diabetes, and she had to nurse him until his death, which took place after about two years. During the last year of her husband's illness she began to become distraught and forgetful, and to exhibit other signs of morbid anxiety, but at the time this did not attract much notice. Immediately after her husband's death she was sent to Harrogate for a rest. There she suffered from severe constipation—described as stoppage. On her return home she became definitely asocial and melancholic: she also developed delusions of poverty and wickedness. The next eighteen months were spent as a resident patient in the houses of three different doctors. At the end of this time she was reported as slightly better, but she still had the same mental symptoms. She complained further of general weakness, and said that whenever she wanted to do anything she felt as if her brains were being stirred up with a spoon. Catamenia were suppressed.

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\* Since writing the above, early in 1920, I have seen in a paper by Dr. Ernest Jones—*Recent Advances in Psycho-analysis*—that Professor Freud, during the war, turned his attention to the subject of "Trauer und Melancholie". I have not had access to the original, but from the brief review by Dr. Jones I judge that the following notes are not at variance with Professor Freud's findings, immeasurably though they must fall below them.

There was a haze of albumin in the urine, and blood-pressure was 200 mm. Hg. She had the typical melancholic rigidity and handshake. In other respects nothing abnormal was discovered in her bodily functions. It was at this time that she was referred to me in the hope that analysis might be able to accomplish something where all else had failed.

During the preliminary step of establishing friendly relations and getting her to relate her story as far as she could, I noticed that her great dissatisfaction apparently was directed against herself. She accused herself of being a great cause of trouble to others, acknowledged in exaggerated terms their kindness to her, and "felt furious that she was so damnable". Yet it was noticeable that the outpouring of these accusations against herself, rather than causing distress, gave her relief.

I then began a word-association test, the most important feature of which was the long reaction times on such words as duty, luck, injustice, narrow. Free association on these themes revealed the fact that patient felt herself to be oppressed and wronged by her environment. As an example, the chain of free associations given in response to 'duty' was as follows: "Duty—never done—putting yourself in the background, everything I think of is stopped—I feel as if someone had got me squeezed—one ought to have one's own individuality—it is sad—oh, one's surroundings!" In the same way the response to 'luck' began emphatically with "No such thing", but ended up with the plaint, "It just depends what you have got".

Analysis showed that patient was of a frivolous temperament, and that the smaller gaieties and pleasures of life appealed to her. She was fond of the society of men, but expected their esteem as a right rather than as a thing to be won. The death of her husband, in her own estimation, deprived her of her standing and comfort in life, and it was evident that she unconsciously harboured a grudge against him on this account. This was never openly expressed, for, on the contrary, she spoke with exaggerated tenderness about him and heaped all the abuse upon herself. Thus unconsciously she identified herself with her husband. The symptoms of morbid anxiety, which first appeared about a year before his death, came on, as she recalled during the analysis, the very night after she had definitely been given a hopeless prognosis about him.

Unfortunately, during the whole of the analysis, patient only furnished me with two dreams, declaring that she could not remember dreams even when she had them. The first dream was as follows: "I was in a coffin; wanted to get out and throw things off. I thought I was dead, yet knew all the time that I really was not. I woke up in a fright". Analysis showed that this dream expressed patient's

retirement from the world of action. She blamed her uncongenial environment and her husband's death for forcing this retirement upon her. She wanted the good things of life, considered herself deprived of them, and felt the struggle to remove obstacles to be too difficult, although realizing that but for her inertia she might return to a normal life. The other dream depicted her father as marrying again, and thereby setting her free to go and devote herself to the *début* of her daughter, who was shortly to leave school. In this dream patient identified herself both with her father and her daughter, and each of them with her husband. Remarriage would do away with the deprivation, but this was opposed by a fixation under the guise of duty. During the analysis it transpired that patient was particularly anxious that her daughter should be saved from the cramping environment in which she herself had grown up. The mental conflict between her desire for freedom and her feeling that duty compelled her to remain in her old environment was severe. Often she expressed it in the phrase, "What is the good of me!" Being good for nothing was in fact a compromise formation which indicated her inability to arrive at a satisfactory solution of the conflict.

Strange to say, the delusions disappeared—probably because they lost their value to the patient—quite early during treatment. The delusion of poverty appeared merely to excuse patient from attempting actively to break away from the surroundings which she abused so lavishly. Thus, if she lacked money she must perforce remain passive and submissive to those upon whom she was dependent. Perhaps also a poverty of spirit was being symbolized. Actually, though not wealthy, she had been left comfortably provided for quite apart from financial aid by her father. The delusion of wickedness was over-determined. It seemed primarily to have arisen from repressed desires to break away from the conventions in which she had been brought up. Another factor was the unconscious grudge which she bore her husband for deprivations which his death had brought upon her. Secondly it came to have value as an explanation—rationalization—of the cause of her condition. Thus, "If I am in this awful state it must be a punishment for my sins".

The mental mechanism in the above case seems to be a displacement of the reproach from the environment, including the husband, to the self; analysis showing that the abuse which the patient heaped so lavishly upon herself was really intended for the former, which she considered to be wronging her. Hence the abuse of herself was well borne; indeed, it even gave her a certain satisfaction. At the same time the reproach and the depression were in a sense justified, for it was her own fault that she made so poor an effort to cope with the depression into which the deprivation had thrown her. The displace-

ment further served as a defence against any reproach which others might level against her, for whatever the latter might say they could not accuse her of anything more than that which she herself constantly reiterated. In this way she completely disarmed criticism, and any attempt to coerce her was met by a mule-like accentuation of symptoms. The mechanism demonstrated in this case, may be described as introjection, and is diametrically opposed to that of projection, which is characteristic of the paranoie. The melancholia, as revealed by withdrawal of interest in life and mental and physical inertia, corresponds to the patient's refusal to adapt herself after a deprivation, or to continue the struggle with disagreeable circumstances which she considered to have wronged her. It is as though a sulky child from whom a particular toy had been taken declared that she would never play again any more.

The patient's earlier history served to explain her general attitude to life, and why, when deprived of what she desired, she responded by this particular neurotic regression rather than another. Apparently the melancholic has a poorly-developed ego-ideal, in this respect again presenting an antithesis of the paranoie. The paranoie, by projection, externalizes his conscience, while the melancholic, by introjection, heaps upon himself all the abuse that is really intended for his environment, including the loved person. The melancholic thus behaves more like a sulky child when deprived of the gratification of his narcissistic libido, his conscience being less developed than is that of the paranoie, the specification of whose ego-ideal is higher.

The following extraneous aids were made use of during the analysis. In the early stages the patient, not being in an acute condition, was encouraged to do certain small tasks which were obviously within her power, such, for example, as five-finger exercises. These were gradually increased until she could play the piano as well as formerly. It was exceedingly important in all these graduated exercises that she should agree at every step that she was able to perform the task set, and to this end the task or its increment had to be so obviously within her power that she could not refuse it.

The course of the analysis was deliberately interrupted about every six weeks, for a few days, during which the patient was sent away with her companion for a holiday. The object of this procedure was to aid her by relieving the monotony of her environment, and to keep her in touch with things which really appealed to her, and thus if possible prevent her from settling down into an absolutely chronic state in which all interest was lost. On the first two of these holidays she went apathetically; even unwillingly, but subsequently she manifested an interest in them and began to collaborate in making up a

programme. At this time also her catamenia reappeared, and have remained regular ever since.

It is not claimed that the mechanism revealed in this case is demonstrable in, or can account for, all so-called melancholic conditions: but I consider it worth reporting, for other cases also have led me to believe that the underlying factor in melancholia is a failure of readaptation to an environment which, owing to a certain deprivation, has been rendered devoid of interest. Individuals with what, for want of a better expression, may be termed a sulky character, respond to this neurotically by a physical and mental inertia, and defend themselves by displacing the reproach from the environment to the ego. There is further an identification of the self with a beloved person who is blamed for having caused the deprivation.

Associated delusions, if present, are of small moment: and of all the psychogenetic psychoses melancholia is the most amenable to treatment, though in view of the frequency of relapses one is not justified in speaking of a cure.



## Short Notes and Clinical Cases.

### A NOTE ON INTELLIGENCE TESTS.

BY W. JOHNSON. LIVERPOOL.

THE study of the child mind is occupying more and more attention in modern times. Considerable advances have been made comparatively recently, chief amongst which has been the establishing, on a scientific basis, of a standard by means of which the individual child's intelligence can be judged. Binet's tests, while being admittedly scientific, were framed from the practical standpoint, and their introduction marked a definite era in the investigation of child psychology. The publication of his conclusions has been followed by the appearance of several modifications of the Binet tests. The literature in English on the subject is somewhat meagre, and the recent publication of *The Measurement of Intelligence*<sup>1</sup> will be of considerable service to English workers. The author bases his work on the Binet tests, giving certain modifications and additions which he has proved of value in practice (these constitute his Stanford revision of the Binet method).

Everyone has recognized more or less definitely for himself the existence of those finer grades of intelligence by which particular children are marked off the one from the other; but we are accustomed to think of such differences in the abstract—for want of a definite system by which intelligence may be investigated. Roughly speaking, children have been grouped into (1) normal, and (2) backward or feeble-minded. When considering the latter, the medical mind has been occupied too much by the physical accompaniments of mental deficiency—the so-called stigmata of degeneration (shape of skull, anomalies of ear, eye, palate, hands, etc.), while the analysis of the mental state has tended to be neglected. It is indeed true that Binet's tests are of considerable value in estimating degrees of feeble-mindedness, yet it is now obvious that a much wider field of utility is provided for them by the group of children whom in a vague sense we term 'normal'. Many weeks, or even months, may be painfully traversed before a given child's limitations may be established. Such time is not only wasted, but is harmful to the young scholar from the point of view of his being held up as a 'failure'. With the Binet

tests a very complete examination of the intelligence can be made in the course of a single hour. Further, the advantage of such a scale is that a comparative test can be carried out six-monthly, yearly, etc., and the rate of advancement estimated with due regularity.

**The Tests.**—The special books on the subject must be consulted for the details representing the actual scale of the Binet tests.<sup>2</sup> Suffice it to say here that it is a system of definite standards of intelligence compiled for almost each year of child life. There are six tests in each of the yearly intelligence standards from the age of three years to ten years. The eleventh year and thirteenth year are omitted, and thus standard tests for the twelfth and fourteenth year only are supplied. In order to give a sense of completion to the method, the series terminates with a standard test for adult life (sixteenth year). Much care is necessary in the application of each series of tests. The subject must not be allowed to become tired during the examination, the duration of the test being varied according to age. The examiner must be able to hold the child's attention by maintaining interest. Outside distractions must be carefully guarded against. Mental anxiety on the part of the child as the result of being in the presence of a stranger must not be ignored. The presence of a third person paves the way for the entrance of additional complications. Tact, and knowledge and understanding of children, are the essentials to success, i.e., the personality of the examiner is of very considerable importance.

**The Application of the Method.**—Judged by these standards, the large promiscuous group of so-called 'normal' children becomes an interesting series of fairly well-defined grades. Instead of, as before, possessing a vague ill-defined idea concerning a particular child's ability, the examiner can now carry out an investigation and measure his intelligence against a series of well-defined standards. Such an estimation is of value to the child as well as to his fellow scholars, who, as the case may be, are either retarded by him or vice versa. It must be understood that the tests are not tests of learning but of the standard of intelligence with which the individual is endowed. It is the ability to learn which is being weighed in the balance, and not the amount learnt. Practical experience of the Binet tests has established the wide variability of such capabilities in the mass of normal children to a degree which is indeed surprising. The result of the investigation gives the mental age of the child. This may correspond with the actual age, or be either well behind or in advance of it. The tests now in use do no more than estimate native intelligence up to the standard reached by a normal individual of sixteen years (the so-called adult standard). When it is required to express the result of the examination of intelligence numerically, this may be

done by means of the intelligence quotient (I.Q.). This is obtained by dividing the mental age by the real age. Thus, if a child of twelve years gives, as the result of testing, a mental age of nine years, I.Q. is  $\frac{9}{12}$ , or .75.

**Practical Utility and Scope of the Measurement of Intelligence.**—Children whose mental age is well in advance of their real age should be placed under special conditions, where, without any undue forcing, the faster progress of which they are naturally capable is open to them. Those whose mental age is behind the real age can be graded down to their appropriate school class, and in this way much unnecessary punishment and disappointment avoided.

Where the intelligence is sufficiently low (I.Q. about .75) for the child to be graded as feeble-minded, a large field begins to open out for discussion, in which eugenics, charity associations, defective schools, etc., etc., all figure. It must be left to future advances in this work to point the way to definite courses of action. At present all one can say, when confronted with the indisputable evidence that from one mentally unsound partner in marriage between four hundred and seven hundred offspring—a large percentage of whom are feeble-minded, vicious, and criminal—have been traced, is that there is a large scope in this preventive branch of medicine from the national point of view.

At the same time it must be remembered that grading the child intelligence by any stereotyped set of rules is an exceedingly ambitious undertaking. In the wrong hands, it is quite easy to see, the result might be a disastrous interference. The dangers of the application of such a method will no doubt be reduced to a minimum as its use becomes general. The Binet tests, as they stand, act as an indication of the presence of a high-grade intelligence on the one hand or of feeble-mindedness on the other. For the various grades between these, they also supply us with a series of standards by which the so-called normal children can be graded. But it is very necessary that we should realize that intelligence is only one side of child psychology. There are, for example, such powerful factors as the emotions, moral character, etc., which are of supreme importance in the mental make-up of an individual. The question what relation, if any, exists between the degree of intelligence and these other factors in the one individual is of considerable interest; also, what the effect on intelligence may be of the occurrence of a serious illness or some disability in child-life. These and similar problems will no doubt tend to be elucidated by a widespread application of intelligence tests and the careful compilation of results on a large scale. Up to now, certain definite points appear to be established:—

1. There is no sharp demarcation between grades of intelligence.

Amongst a miscellaneous group of children there is a gradual merging through all stages of intelligence, from high intelligence down to feeble-mindedness. The so-called 'normal' child easily forms the largest proportion, and composes the central bulk of the group. High intelligence forms the extreme at one end and feeble-mindedness at the other.

2. The occurrence of high intelligence is as frequent as that of extremely low intelligence.

3. There is no particular year in which individual mental variability is especially marked, a group of children six years old showing as much variation individually as does a similar group, age fourteen years.

4. As regards sex, it is found that below fourteen years girls are slightly more intelligent than boys, but after that age the advantage swings slightly over to boys.

5. Children from the higher social status are slightly above the normal intelligence, and those from the inferior slightly below it.

In the course of time, no doubt, the development of intelligence tests will proceed towards the direction of its application to adults. Their scope will then be considerably widened. They may possibly provide us with the much-needed guide for the selection of particular individuals for particular work or professions, as well as providing a definite indication that a certain individual is entirely unsuited for a certain employment or career. That such important decisions—which in young adults are not infrequently life decisions—are left largely to chance is a misfortune which doubtless has produced, and will continue to produce, dire consequences in many a life. From many aspects, therefore, the advance in the study of comparative intelligence will prove of the greatest practical utility. The progress which has already been made in the subject has established it on a permanent foundation. The superstructure remains to be built.

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## Critical Review.

### THE LOCALIZATION OF FUNCTION IN THE CENTRAL NERVOUS SYSTEM: A REVIEW OF SOME RECENT STUDIES OF ANIMAL BEHAVIOUR.

BY C. P. SYMONDS, LONDON.

IN recent years there have appeared many valuable contributions to the study of function in the central nervous system and the correlation between function and structure. Many of these papers have dealt with problems of cerebral localization: the work of Liepmann and Wilson upon apraxia in relation to lesions of the cortex cerebri and corpus callosum: Head's studies upon sensation and the cerebral cortex: the observations of Holmes upon disturbances of the higher visual functions in patients with lesions of the parietal lobes: and the vast mass of literature which has grown up around the classical work of the Vogts and Wilson upon the basal ganglia, may be mentioned in illustration. Nor have problems of functional localization at lower levels failed to receive a fair share of attention, as witnessed by the careful studies of the midbrain, cerebellum, and spinal cord, which, in the hands of the clinician and experimental physiologist, have thrown considerable light upon the functional importance of these structures, and on the respective physiological value of the various cell stations and fibre tracts contained therein. Inspired by the writings of Hughlings Jackson, and approaching the study of modern researches in an attitude of mind determined in some degree by the tradition of his genius, the British school of neurology shows a tendency to a somewhat rigid belief in the exclusive localization of separate functions at set levels in the nervous hierarchy.

Thus it is assumed that there are in man at least three such levels where certain neurones are grouped together, so that the cerebral hemispheres alone are responsible for the execution of phasic movements of the so-called conscious order, the basal ganglia and midbrain nuclei deal with the maintenance of posture, equilibration, and rhythmic movements of progression, while in the spinal cord there



are ordained special conjunctions of neurones for the performance of mass-reflexes of a protective or excretory nature.

It has been generally held in this respect that the centres and pathways, through which are mediated the various functions specified, are laid down at birth or develop shortly after it in accordance with a definite plan, which is an inheritance of the ages evolved through countless generations in accordance with the laws of natural selection. According to this view, individual variations in the function of the nervous system depend wholly on variations in its structure, and, in the gradual course of the process of evolution, progressive diversity of function has been achieved by the preservation to the species of variations with a high survival value.

These beliefs have driven neurologists persistently to seek light upon obscure problems of function in theories of their phylogenetic origin, often with illuminating results. There are, however, dangers in the way of those who follow this path of thought too closely, lest they become so enamoured of the theory that they find in it a place for each new observation, with never a pause for analysis and a fresh survey of the facts.

### THE STUDY OF BEHAVIOUR.

Upon the nervous system with its dominant function of integration the living organism depends for its ability to adapt itself to varying conditions in its environment, and the adaptations so made are summed up in the word behaviour.

Glancing briefly at the phylogeny of the nervous system, we see that at a certain point in its evolution there has been a divergence of the ways. In the primitive organism the modes of response to environmental factors are few in number and strictly limited in character. In the further course of development the adaptive mechanisms become more numerous, but are still innate and invariable, and continue to be so throughout the whole of the insecta. With the development of the vertebrate phylum, however, there appears, in addition to the innate invariable characteristics of behaviour, an increasingly larger number of individually acquired and variable modes of response, reaching a high degree of importance in mammals and culminating in man.

An impetus has been given to the study of these variable factors in behaviour by the formulation of laws governing the acquirement of conditioned reflexes. It has been shown that the exhibition of food to a hungry dog excites the secretion of saliva: if now a bell be rung at the same time as the food is exhibited and this conjunction of stimuli be repeated a number of times, the sound of the bell alone will become an adequate stimulus for the reflex secretion of saliva. In

other words a stimulus—the ringing of the bell—which previously produced no response, becomes capable of initiating a definite bodily reaction: the animal has acquired a new mode of response to a factor in its environment.

Much work has now been done to prove that a very large proportion of all human behaviour is made up of conditioned reflexes acquired on similar lines, and this has led to careful objective studies of behaviour in the human infant.

J. B. Watson, in a series of experiments upon new-born babies, has demonstrated that many reactions popularly supposed to be innate or instinctive are really acquired as conditioned reflexes, and that the stock of inherited invariable modes of response is smaller than was formerly held. He has proved, for instance, that the human infant does not show the reactions characteristic of fear in response to contact with or sight of animals, but that such a reaction may be conditioned by making use of the innate fear response to a sudden loud noise. He has further shown that the blinking reflex which occurs in adults when a threatening movement is made towards the eye is not present at birth, and is not observed before the fifty-fifth day. Observations such as these are of the highest importance, and it would seem that purely objective studies of behaviour reactions in the newly-born may lead to more critical views of the theories at present held concerning the nature of reflex phenomena in decerebrate and spinal man.

In the case of other bodily systems the establishment of a new function is accompanied by corresponding structural adaptation: when a man learns the trade of blacksmith the muscles of his arms hypertrophy, as we say, to meet the demands of his new work. In the nervous system, however, as far as we know, there is no possibility of such a new growth of cells and fibres, so that we are forced to the conclusion that newly-acquired habits must be mediated by pre-existing neurones.

In the formation of a habit we are tempted to believe that some change in the structural formation of the neurones must take place, some knitting of synaptic connections in one direction and loosening in others; but of what actually does occur we know nothing.

Many questions naturally arise in this connection, some of which have been answered by experimental work upon animals, others by observations of disorders of nervous function in disease with correlation of the structural lesions found post mortem. As an instance of the latter we may take the researches which have shown that the acquired habit of speech in man depends upon the integrity of certain fairly well-defined areas of the cortex cerebri, which in right-handed persons are always in the left hemisphere. Destruction of these

areas results in loss of the habit acquired. In such studies of the structures involved in the process of learning, chief attention has naturally been paid to the cerebrum, on account of its steadily increasing predominance in size and complexity of structure, as compared with the rest of the nervous system, in the higher mammalia and man. And with the advance of our knowledge there has arisen a tendency to the belief that a great many acquired functions are localizable in the cerebrum—that centres and pathways lie ready for their use in the inherited structure of the brain, which are the same for all men, and that we may in time be able to map out the cortex in a veritable mosaic of functional topography.

### THE EXPERIMENTAL WORK OF FRANZ AND LASHLEY.

Some recent experimental work in America throws a new light upon the old problems in which there appear certain novel features of startling importance.

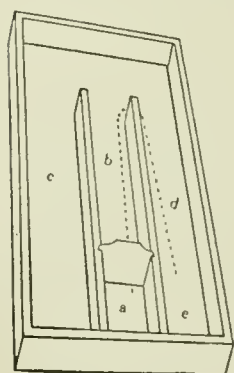


FIG. 1.—THE SIMPLE MAZE.  
a, Starting compartment; b, Middle alley; c, *Cul de sac*;  
d, Alley leading to food, &c.

S. I. Franz and K. S. Lashley, having been for some time past at work upon the training of rats to acquire various habits of a more or less complex nature, were led to the investigation of the following questions in relation to these animals:—

1. Is any one part of the brain essential for the learning of habits, or the learning of a particular habit?
2. When such a habit has been learned, is there any one area, the destruction of which will lead to the loss of that habit?
3. If a habit can be lost as the result of such a destructive lesion, may it be re-acquired?

The authors commenced their researches by endeavouring to ascertain the results of destruction of the frontal lobes in rats which had been trained in a simple maze. The maze was built of wood with a wire cover in the pattern shown in the accompanying figure (*Fig. 1*). The rat when hungry was placed in the starting compartment (*a*), and the sliding door was then lifted. When first introduced into the starting compartment the rat would sniff at the wire cover and at the sides and corners of the compartment, paying no particular attention to the door. When the door was raised he would stand erect and sniff at its lower edge before venturing into the first alley. With practice his reactions became centred on the door; on being introduced into the starting compartment he would try to push it up, or sniff at the crack under it.

Now the moment the experimenter touched the door to open it, the rat would turn with his head in the right front corner of the compartment, ready to crawl out as soon as he had sufficient space. In first trials the rat would spend much time in sniffing at the cover, walls, and corners of the maze. After training he would go from starting compartment to food in 1·2 second. The minimum time spent on the first trial by any of sixty rats trained was 8 seconds, and the mean time 30 seconds, most of which time was spent in exploratory sniffing. With practice these exploratory movements disappeared, and the animal would run to the food without a pause. Many of them came to follow the path marked by the dotted line in *Fig. 1*, being the shortest possible route to the food.

Each rat was given a fixed number of trials each day until ten successive trials had been completed without error, and this was taken as evidence of completion of learning. (It was found that, after this point was reached, rarely more than six errors were made in the next consecutive hundred trials.)

The total time consumed in the course of learning was recorded for each animal for the first trial, and for the first fifteen trials. In a number of rats so trained the frontal lobes were destroyed through trephine openings under anaesthesia, and the animals tested in the maze within twenty-four hours of the operation: the total time and number of errors for the first trial, and for the first fifteen trials, were again determined, and being compared with the original figures showed that in no case was the habit lost. For instance, in the case of the rat first tested the results were as follows:—

				In Learning	After Operation
First 15 trials	{	Total time	..	188 seconds	54 seconds
	{	Errors	.. ..	5 ..	1 (?) ..
First trial	{	Time	.. ..	15 seconds	2·6 seconds
	{	Errors	.. ..	0 ..	0 ..

When the experimental part of the work was complete the animals were killed, and the brains hardened and cut in serial horizontal sections, from which the exact extent of the lesions in each case was mapped out and recorded in a diagram.

The results showed that the entire frontal pole of each hemisphere was destroyed in one or another of the animals, and that no one part of the frontal pole remained undestroyed in all. The conclusion reached therefore was that no particular part of the frontal pole of the rat's cortex is necessary for the retention of the simple maze habit.

The technique of the first series of experiments has been fully described for purposes of illustration. As the result of further studies with the simple maze it was found: (1) That the habit may be *retained* after the destruction of any part or all of the cortex lying in front of and above the knee of the corpus callosum, and after the destruction of any part of the temporal or parietal regions; (2) That the *maze habit may be acquired* after the destruction of all the cortex included within these areas, and after the destruction of one, perhaps both, of the striate nuclei.

In a further series of experiments rats were trained to a more complex habit. Within a wire cage was set a problem box containing food, the door of which could be unlatched only by pressure upon

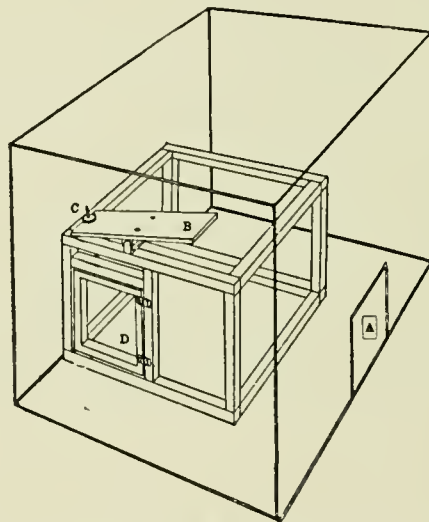


FIG. 2.—THE INCLINED-PLANE BOX.

A, Door of restraining cage; B, Inclined plane; C, Catch extending down to upper edge of door; D, Door leading into food-box.

the free end of an inclined plane set upon the roof of the box (*Fig. 2*). In order to gain the food, therefore, the rat had first to depress the inclined plane, then jump down and enter the box through the open door. The frontal lobes were destroyed in trained animals, and the results of post-operative tests compared with the original trials as in previous experiments. It was found that some of the animals retained the habit, while others lost it, and comparison with the post-mortem sections showed that whereas retention had been observed in several cases with *partial* destruction of the frontal lobes, in no case in which these lobes had been *completely* destroyed was the habit retained.

Partial destruction of the frontal pole did not always result in



loss of the habit, but an attempt to find a correlation between the part destroyed and the retention or loss of the habit revealed the further fact that no single part of the frontal pole escaped destruction in the animals which *retained* the habit (i.e., if a map were made to show the *combined extent* of the lesions in these animals the whole frontal pole was included).

"It follows that although some part of the frontal region must remain intact if the plane-box habit acquired by the normal animals is to be retained, the particular part preserved is immaterial. The different parts of the frontal region are, to adopt a term from experimental embryology, 'equipotential in the functioning of the habit'."

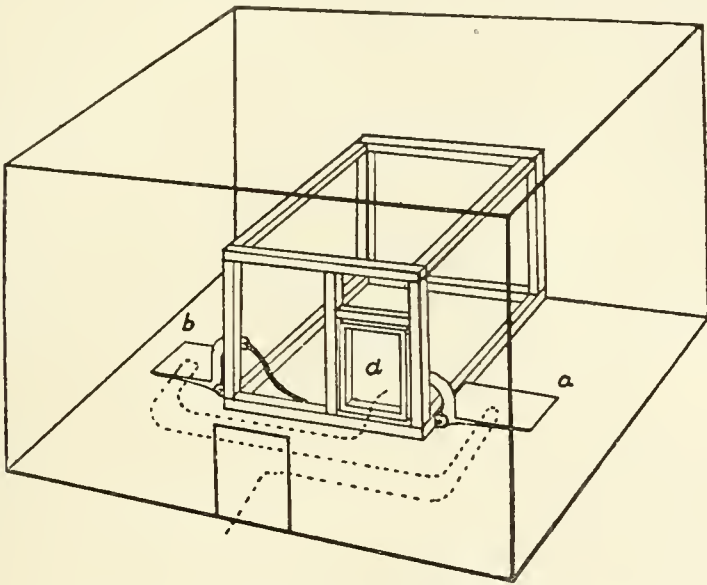


FIG. 3.—THE DOUBLE-PLATFORM BOX.

*a, b*, Platforms which must be pushed down in the order *a-b*, in order to open the door, *d*, to the food-box.

A further series of experiments was now carried out to determine the ability of rats, with various parts of the cerebrum destroyed, to learn more complex habits. For this a new problem box was devised (Fig. 3), the door of which was opened inwards by a strong spring, but was held shut by two latches. These were released by pressure upon two platforms, one on either side of the box; in order to open the door it was necessary for the animal to press first upon the right then upon the left-hand platform. Failure to perform these movements in the correct order resulted in failure to open the door.

As a measure of learning, the following arbitrary criterion was employed. The animal must go directly from the door of the outer

cage to the right-hand platform and push it down: he must then go by some constant path to the other platform and, after pushing it down, must go directly to the open door and enter the problem box. Any deviation from the direct path, or pause to sniff at the door or other part of the problem box, was counted as an error. Three trials were given daily, and three successive trials without error had to be made in one day before learning was considered perfect.

In this series of experiments the animal was given an hour for each trial, and if it had then failed to solve the problem it was removed from the box. The 'learning time' was recorded in terms of the number of trials required.

As a preliminary, ten normal animals were trained (*Group 1*), and then five groups of animals in which various portions of the cerebrum had been removed at operation. In *Group 2* one or other hemisphere was removed as completely as possible; in *Group 3* both occipital lobes were removed: in *Group 4* the parietal lobes were destroyed on both sides; in *Group 5* both frontal lobes were removed; and in *Group 6* the frontal and parietal lobes were destroyed in both hemispheres.

The combined lesions in these animals therefore covered the whole cerebral substance. The results of these experiments are shown in the following table:—

THE AVERAGE NUMBER OF TRIALS REQUIRED FOR LEARNING THE DOUBLE-PLATFORM BOX BY NORMAL AND OPERATED GROUPS.

Group	Lesion	Average Trials	Range of Variation
1	Normal .. ..	142.6	63-204
2	Hemidecerebrate ..	87.2	49-141
3	Occipital injury ..	68.8	45-107
4	Parietal injury ..	80.0	41-101
5	Frontal injury ..	90.0	90
6	Frontoparietal ..	39.0	27-51
	All operated ..	79.0	27-141

From this table it appears that the operated animals were not at all inferior to normal ones trained under the same conditions. In fact the animals with cerebral lesions appeared to learn more quickly, which was shown to be due to the tendency of the normal rat in the earlier trials to leap over the platforms, whereas the parietic animal was more likely to trip over it, and in the process of trial and error to arrive at the solution more rapidly.

The functions of deeper structures in learning were next called in question, and it was shown that the rate of learning was unaffected by destruction of the hippocampal lobes and striate nuclei.

These experiments showed that no single part of the cerebrum was necessary for the learning of the double-platform-box habit, and no single part was proved to be significantly more efficient in learning than any other part. For the acquirement of the habit the various parts of the cerebrum seemed to be absolutely equipotential. "Moreover, at best 50 per cent of the cortex can be dispensed with without marked deterioration, and there seems to be no relation between the absolute quantity of cerebral cortex functional and the ability to learn."

A number of rats were now trained in a habit involving visual discrimination. The problem box used offered a choice between two alleys, and at the end of each alley a circular translucent plate was fixed. One of these was illuminated, the other dark. It was found in animals so trained that destruction of the frontal or parietal regions did not affect the habit. But in three animals in which both occipital lobes were destroyed the habit was completely lost. That this was not due merely to the shock of the operation was proved by a control experiment. Close observation showed that vision was not lost in these animals, and in the case of two of them in which the attempt was made *the habit was relearned in normal time*. This shows that in normal animals the visual habit is mediated in some way by the occipital region and by the occipital region alone, but that in the absence of this region *other parts of the nervous system are able to take on their function*.

## THE SIGNIFICANCE OF FRANZ AND LASHLEY'S WORK.

Lashley expresses his conclusions in the following words:—

The point most clearly demonstrated is the complete vicarious functioning of all parts of the cerebrum in learning. Not only are areas to which associative function might be ascribed unnecessary for the acquirement of habits, but even projection areas, which have been considered as hereditarily organized relay stations for impulses to or from the cortex, may be dispensed with without any discoverable loss in ability to learn a difficult reaction which is normally mediated by those areas. This capacity for vicarious functioning seems to hold true both for the cortex and for the underlying structures making up the archipallium. Such a fact can only be explained by the assumption of a fan-like distribution of fibres from the lower centres to all parts of the cerebrum, permitting incoming impulses to reach any part of the cortex, which happens to be intact, with equal ease.

Yet, if this is the case, it is not clear why any particular part of the cortex should function to the exclusion of other parts in the formation of a habit under normal conditions, unless we can further assume a somewhat greater concentration of fibres from given lower centres in given cerebral areas. Probably this represents the true state of affairs, for it is evident, from the fact that destruction of the frontal or occipital regions abolishes

corresponding habits, that under normal conditions the various parts of the cerebrum have specialized functions. Nevertheless, this specialization is only relative, and is of such little practical consequence that learning may go on with equal speed in the presence or absence of the specialized areas.

The results further form a strong argument against the existence of any cerebral areas which have a directive influence over learning, whether it be by 'attention' mediated through the frontal lobes or by the 'conscious action' of the brain as a whole. On the contrary, they suggest that the only essential condition for learning is the simultaneous activity of two reaction systems which are in anatomical connection by association fibres.

### SUMMARY OF OTHER EXPERIMENTAL DATA.

Some attempts had been made previously to train animals with experimental lesions of the cerebrum. In the course of his studies of the decerebrate dog, Goltz (1892) made no definite attempts at training, and, apart from the improvement in walking shown after recovery from shock, reported the acquisition of one function only. He noted that at first the swallowing reflex could be elicited only by placing food in contact with the pharynx. Gradually the reflex came to be called out by more distal stimuli to the tongue, chewing movements appeared, and on the twenty-fourth day after operation food was first taken when placed against the lips. A similar improvement in a dog after decerebration was noted by Rothmann (1912), who also trained his animal to walk upon its hind legs with the fore feet supported. Burnett (1912), in a careful series of experiments, failed to obtain the maze habit in decerebrate frogs.

Franz (1902, 1907) showed that destruction of the frontal lobes in cats and monkeys is attended by loss of recently-acquired habits, but that these habits may be re-acquired in normal time.

Leyton and Sherrington (1917), in the course of studies upon the excitable cortex in anthropoid apes, performed certain ablation experiments which they summarize in the following words:—

Ablation of the cortex of the larger part of an arm or leg area in gyrus centralis anterior produced heavy paresis of the corresponding limb; but this paresis quickly lessened and the limb soon regained in large measure its volitional mobility, and became successfully used for climbing, picking up food, picking the teeth, etc. Ablation further of the greater part of the arm area of the second hemisphere induced no recrudescence of paresis in the already parietic and partly recovered arm. After the double lesion, considerable recovery of the volitional use of both limbs somewhat rapidly ensued, the hands, for instance, being used freely in climbing, picking up food, etc.

Ogden and Franz (1917) performed experiments in which hemiplegia was produced in monkeys by the application of the electro-cautery to the motor cortex, which was previously delimited by

electrical stimulation. They found that if the monkey were untreated very little recovery took place in the course of six months; if ordinary massage were used there was very little improvement. But if the sound side of the animal were restrained so that movements of climbing and feeding must be made if at all by the use of the paralyzed segments, improvement was rapid and recovery practically complete.

### AN APPLICATION OF THESE RESULTS TO CLINICAL NEUROLOGY.

The question naturally arises, "How far are we justified in applying to man the experimental data obtained from rats?"

Lashley considers that there is no justification for assuming any fundamental difference between the cerebral mechanism in the rat and man. The differences between the rat and the ape are scarcely greater than those between the ape and man, and in both cases are differences of degree:—

Both the sensory and intellectual capacities of the adult man are the result of years of training which have led to the establishment of countless habits having a definite structural basis. Cerebral injury may destroy a very great number of these instead of the few which such an animal as the rat has formed, and the apparent loss of function will therefore be greater. Further, the rate of learning in the human adult depends largely upon the number and complexity of the habits already formed. When the latter are abolished, the entire system must be built up slowly *de novo* before anything like an approach to adult performance is attained. . . . The rat loses less than higher forms after cerebral injury because he has less to lose, and he seems to recover more rapidly chiefly because a little improvement brings him relatively nearer the standard of comparison (normality) than does the same amount of impairment in man.

It follows from Lashley's arguments that he submits the possibility of complete vicarious function in the human brain. Even in the rat, however, he is forced to admit the existence in normal animals of inherited structural peculiarities favouring the localization of certain habits in particular areas of the cortex. And it seems probable that such specialized pathways are more numerous in higher mammals. In relation to this point, clinical experience so far is entirely opposed to the possibility of re-acquisition of the faculty of speech when once the centres normally mediating this function have been completely destroyed.

The observations of Leyton and Sherrington, already referred to, support his view that vicarious function in relation to simple motor habits may be possible in the anthropoid apes.

The possibility of some degree of vicarious function in the central nervous system is obviously of the highest importance in the treatment of cases of organic nervous disease. The knowledge that within



the brain and spinal cord neurones once destroyed can never be repaired, and the assumption of specific localization of function in these neurones, have led the practitioner to a somewhat hopeless view of these cases.

Franz was inspired by his earlier work to turn his attention in 1915 to the possibility of retraining patients suffering from paralyses due to old cerebral lesions. He attempted the re-education of five hemiplegies whose lesions were of many years' standing (the most recent dated back to an apoplexy eight years before). By means of the employment of stereotyped methods of training and estimation of the learning times required, he was able to show that a great deal of improvement could be effected even after this length of time, but that the process of re-education was comparatively slow and required much patience and energy on the part of the teacher. He concludes his paper with the remark, "We should probably not speak of permanent paralyses or of residual paralyses, but of uncared-for paralyses."

Attention has been widely called of late to the so-called hysterical element in organic nervous disease. The theory advanced to explain this condition is that the original disturbance of function produced by transient damage to nerve-fibres is perpetuated by a process of auto-suggestion. This is doubtless true in a number of cases.

But is it not possible that the methods of *re-education* which prove so successful in the hands of the exponents of the theory are *truly* educative, in that the results represent a process of re-learning, by means of other structures, of functions lost by destruction of the original pathways—a true instance of vicarious function? If we could accept this view, we should be able to differentiate such cases and exclude them from the heterogeneous mass of clinical material generally labelled 'hysterical', a procedure which might help us towards a clearer view of hysteria as a nosological entity.

To the student of neurophysiology these researches afford problems of fascinating interest. We have been accustomed to regard the reflex phenomena in decerebrate and spinal man as examples of inherited pattern-reactions released from inhibition by cerebral centres—reactions old in the history of the phylum and we have looked for constant and invariable laws governing these phenomena.

Yet in clinical practice we frequently meet variations which are difficult to explain on the basis of any such rigid formula. The evidence quoted in this paper suggests that some of the reflexes mediated by subcerebral centres may after all be acquired habits, in which such variations might naturally be expected to occur. We may perhaps seek in the history of the *individual* the explanation of the fact that in some cases of undoubted transection of the spinal

cord, contrary to rule, there appear in the lower limbs those reflexes classified by Riddoch as extensor phenomena.

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## Editorial.

### PHILOSOPHY AND MEDICINE.

THOSE who are engaged with medical research or the practical problems of the clinic do not as a rule concern themselves to any extent with the development of philosophic thought. It is natural that this should be so. Philosophy is not concerned with the same problems as science or medicine: its scope is wider. While philosophy assimilates the facts of science, it does so only to understand life as a whole. It aims at formulating general principles which will serve to harmonize all phenomena and to bring them into a consistent and understandable scheme. "The aim of science is the description of facts, the aim of philosophy their interpretation." Thus the philosopher sets himself to solve more difficult problems than does the scientist, who concerns himself with the descriptive formulation of one specific category of facts; and in consequence, not only does he need to possess a wider range of knowledge, but he must have special qualities of mind to enable him to pursue his task. And there is a certain remoteness about his work which creates an impression that his efforts are unproductive and devoid of contact with the practical problems we endeavour to solve. Philosophy is difficult to understand: its outlines are vague: there seems nothing to impinge against as it were. Yet it is not necessarily impractical, and it sometimes happens that the philosopher, while striving to discover a unity in phenomena, and because of his wider vision, is able to furnish an interpretation of the facts discovered by the scientist which is considerably in advance of his time. Such a possibility is naturally most likely to be realized in the spheres of neurology and psychology, the problems of which, in their wider aspects, are especially the subject of consideration by the philosopher. Striking confirmation of such a view is to be found in an article by Dr. R. Mourgue, a French psychiatrist, published in a recent number of the *Revue de métaphysique et de morale*.\* The article is concerned with the philosophic works of M. Bergson, and since it concerns matters of vital significance to

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\* "Le point de vue neuro-biologique dans l'œuvre de M. Bergson et les données actuelles de la science", *Revue de métaphysique et de morale*, 1920, jan.-mars.

the development of neurology and psychopathology, a brief reference to its contents may here suitably be made.

Up to the end of the last century neurophysiology and psychology were dominated by the classical theory of 'centres'—a kind of 'scientific phrenology', as Professor Watson has said. The 'doctrine of faculties', 'psychological atomism', and 'associationism' were of course based on the assumption that independent psychic elements were localized in certain areas of the brain. Such theories being current at the time, it is easy to understand, as Dr. Mourgue points out, that neurologists were but little prepared to comprehend the scientific interest of the views expressed in *Matière et mémoire*, published by Bergson in 1896. Yet these views anticipated to a remarkable degree the facts which scientific observations have elucidated during the last twenty years. In a comprehensive survey of the development of neurology during this period, Dr. Mourgue shows this to be the case. He indicates the basic principles upon which Bergson founded his philosophy, and he shows, by reference to the work of von Monakow, Sherrington, Graham Brown, Bechterew, Elliot Smith, von Uexkull, Head, and others, how these principles have been confirmed by the actual facts which science has been able to furnish.

We cannot here enter into the details included in this article; but the central contention it is designed to develop may be illustrated by a quotation from Bergson: "The truth is that my nervous system, interposed between the objects which stimulate my body and those which I could influence, plays the rôle of a simple conductor, which transmits, distributes, or inhibits some movement". If we now compare this, at the time, daring statement, with a quotation from our last editorial, it will be apparent to what an extent Bergson's views coincided with those which exist to-day. "We must not suppose that the *psychic* phenomenon of sensation is localized by the *physiologist* in the so-called sensory regions. All that is claimed is that these different regions or centres form relay stations for nerve impulses derived from particular classes of stimuli; that these nerve impulses are perhaps rearranged there; and that they are transmitted thence to some more common motor mechanism." The resemblance between the quotations is obvious, and it is certainly remarkable that the facts of scientific observation should prove to be so clearly in accord with the views expressed by the philosopher many years before.

Briefly it may be said that it is the stress which Bergson gives to *movement* which renders his views of such vital significance to the psychologist. In this respect, as Dr. Mourgue shows, he approached his problems from an essentially biological point of view—the term *biological* here meaning that method which aims at explaining physiological or pathological phenomena in living beings provided with a

nervous system, in a language as objective as possible and applicable in consequence to the whole animal series. To interpret psychological phenomena in terms of bodily movement is a truly objective method, and, as the following quotations show, it is in terms of movement that Bergson defines perception. "The nervous system is in no sense an apparatus which may serve to fabricate, or even to prepare, representations. Its function is to receive stimulations, to provide motor apparatus, and to present the largest number of these apparatuses to a given stimulus. . . . This conductor is composed of an enormous number of threads which stretch from the periphery to the centre, and from the centre to the periphery. As many threads as pass from the periphery to the centre, so many points of space are there able to make an appeal to my will and to put, as it were, an elementary question to my motor activity. *Every such question is what is termed perception.* . . . Every perception is prolonged into *nascent action*. . . . Perception measures our possible actions on things, and thereby, inversely, the possible actions of things on us. . . . The *actuality* of a perception lies in its *activity*, in the movements which prolong it, and not in its greater intensity. . . . The concrete feeling that we have of present reality consists of the consciousness of the actual movements whereby our organism is responding naturally to stimuli."

In such phrases Bergson makes it clear that the *psyche* must be interpreted and understood in terms of action and behaviour. Such a view harmonizes with the whole trend of modern psychology, which is now chiefly concerned with the reactions which the individual makes in response to stimuli or situations. The focus of interest has now shifted from the introspective study of consciousness to the more objective study of behaviour—of man in action. And by action is not only meant voluntary movements and speech, but also implicit action—the nascent movements on which Bergson lays such stress—such as bodily postures, attitudes, gestures, tensions, and autonomic disturbances. This tendency to interpret the psychophysical organism in terms of movement or conduct finds its extreme expression in *behaviourism*, a school of psychology which indicates the extent of the reaction against the introspective and academic psychology of the past. Criticism of the behaviourist position might be made on various grounds, notably from the fact that it would seem to ignore the omnipresent fact of self-consciousness; but in so far as it carries the interpretation of the individual in terms of movement to its logical conclusion, so that thought itself becomes implicit bodily activity, it undoubtedly lays the foundation for the erection of a scientific, objective, and practical psychology—a psychology which may be relied upon to furnish contributions of definite value for the future reconstruction of our social organization.



It is not only the notion of movement upon which Bergson lays so much stress, but also that of *development*. Throughout his philosophic works he emphasizes the evolutionary point of view, and he makes it clear that man is a historical being whose reactions are only explicable in terms of his individual and racial past. "The past," he writes, "is preserved by itself, automatically. In its entirety, probably, it follows us at every instant : all that we have felt, thought, and willed from our earliest infancy is there, leaning over the present which is about to join it, pressing against the portals of consciousness that would fain leave it outside. . . . What are we, in fact, what is our *character*, if not the condensation of the history we have lived from our birth—nay, even before our birth, since we bring with us prenatal dispositions ? Doubtless we think with only a small part of our past, but it is with our entire past, including the original bent of our soul, that we desire, will, and act." Such views are, of course, strikingly in accord with the facts that modern psychology has recently brought to light. The aim of psycho-analysis is to unravel the historical past, and the evidence which Freud has brought forward in proof of the view that our present reactions are strictly determined by the influences of the past, perhaps constitutes his greatest contribution to psychology. "From whatever angle we come to the study of the individual—whether on account of a strike, a murder, or a stomach-ache—that study inevitably leads us to a review of the past experiences of the individual, for we are what the past has made us. We react to the present in a manner largely determined by our past experience. The past is not dead or buried : it is part of the living fabric of our present character." Thus writes a modern psychopathologist in phrases which remind us curiously of those which we have quoted from Bergson, and of which we are now only beginning to realize the full significance.

It would be easy to expand this subject, and to indicate other directions in which Bergson has been able to illuminate the problems we endeavour to solve. In the present instance, however, it suffices to bring into prominence the significance of the two great biological principles—movement and development—upon which Bergson might be said to have erected his philosophy, because we feel, with Dr. Mourgue, that these same principles might well become the foundation for a truly scientific understanding of human behaviour.

# Abstracts.

## Neurology.

### NEURO-ANATOMY AND NEUROPHYSIOLOGY.

- [154] Electromyographic studies of muscles during hysterical contraction.—S. COBB. *Arch. of Neurol. and Psychiat.*, 1920, iv, 9.

ELECTROMYOGRAMS were made of six cases which showed hysterical muscular contractions. The author finds that the hysterical muscular contraction gives an electromyogram similar in all essential points to a voluntary, consciously controlled muscular contraction. The short, repeated, hysterical contractions that clinically resemble tremors can be differentiated electromyographically from such a tremor as that of paralysis agitans, or from clonus, by their slower rate and greater irregularity.

R. M. S.

### NEUROPATHOLOGY.

- [155] The structural brain lesions of dementia præcox.—ADELINE E. GURD. *Amer. Jour. Insan.*, 1920, lxxvii, 201.

A SHORT résumé of the work of Alzheimer and other observers since 1897 is followed by the author's findings in a series of nineteen cases of unquestionable dementia præcox studied by all modern methods. With one exception all were cases uncomplicated by other diseases which might influence the nervous system. The majority had a strong hereditary taint of insanity.

The cases are grouped according to the duration of the disease. In the acute catatonic type with excitement lasting about three months, the microscopic changes noted are: a paleness of field, loss of chromatin in nerve-cells, granular degeneration of body and dendrites, marked nuclear changes with folding and irregularity of nuclear membrane and metachromatic alteration of nucleoli, fatty degeneration of glia and nerve-cells, and regressive rather than progressive glia changes. In the second group, with a duration of two to four years, in addition to the changes above noted there are found many shrunken and sclerosed cells in the medium-sized pyramidal cells, and many more cells undergoing Nissl's severe degeneration. The third group includes cases with a duration of ten to thirty-five years, and there are now present, in addition to the changes already noted, a marked increase in glia elements regressive in nature, severe sclerosis of most of the smaller pyramidal cells with acidophil degeneration of the nuclei, many fragmented cells showing

Nissl's severe changes, and considerable alterations in axis cylinders and myelin sheaths.

Special attention is drawn to a change in the staining reactions of the smaller pyramidal cells in these late cases. With the Mann-Alzheimer stain these cells normally show the cell body a medium dark blue, the nucleus a darker blue, and the nucleolus a distinct red. In the degenerated cells referred to, the cell-body is dark blue, while the whole nucleus is a red, varying from purple-red to pale scarlet.

W. S.

[156] **A note on a certain anomaly of gyration in brains of the insane.**—L. G. LOWREY. *Amer. Jour. Insan.*, 1920, lxxvii, 87.

A SHORT paper, illustrated by three plates, describing an anomaly which the author has found present in a high proportion of brains from cases of manie-depressive psychosis and dementia præcox. Normally the central fissure does not connect with any other fissure, but is shut off from the Sylvian fissure by a bar of cortex connecting the pre- and post-central gyri. These gyri are normally continuous, thus preventing any other sulcus from communicating with the central fissure. The anomaly consists in an interruption of either the pre- or post-central gyrus by a fissure running into the central fissure. This condition was found in 63 out of a series of 100 brains examined at the Danvers Hospital, and occurred in 95 per cent of the cases of functional or endogenous psychoses, and in 44 per cent of the organic or extraneous psychoses. The author does not suggest that this anomaly has any causal relationship to the symptoms of the psychosis, but that it may be taken as evidence of a loosely organized nervous system.

W. S.

[157] **The value and mechanism of the colloidal-gold test.**—JOHN CRUICKSHANK. *Brit. Jour. Exper. Pathol.*, 1920, i, 71.

THIS is an inquiry into the factors underlying Lange's gold-sol test. Cruickshank prepared his gold-sol by the method devised by Zsigmondy, and used by Lange in his original work. He found little difficulty in the preparation, but sometimes it was necessary to neutralize the gold-sol accurately, using alizarin red as indicator, before satisfactory curves were obtained with paretic fluids.

His conclusions as to the value of the test are that "in general paralysis the results of the colloidal-gold test coincide with those given by the Wassermann reaction", but there is "no parallelism between this test and other spinal-fluid tests".

To investigate the mechanism of the test he separated the globulin fraction of paretic fluids by half-saturation with ammonium sulphate, and dialyzed a solution of the precipitate in celloidin sacs until free from salt. The contents of the sac were then made up with 0.85 per cent saline to the original bulk of the cerebrospinal fluid used. This globulin solution gave typical paretic curves as well as positive Wassermann reactions. No substances precipitating gold-sol were found in the dialysate. Other fluids giving curves in the 'lucetic zone' were then tested in the same way, and it

was found that the globulin fraction of these fluids after dialyzation gave curves of the paretic type. The albumin fraction was then dialyzed, and, when this was added to the globulin fraction in varying amounts, curves in the 'lucetic zone' were produced. This was explained on the assumption that the albumin exercised a protective action on the colloidal-gold solution. It was found, however, that this protective action was retained after boiling the cerebrospinal fluid and filtering off the coagulated proteid.

The paretic type of curve was not given by the globulin obtained from such fluids as gave a negative result to the Lange test, even when used in much greater concentration than that actually present in the fluid. On the other hand, it was found that fresh normal human serum in a dilution of 1-300,000 gave typical paretic curves, and there was no difference in this respect between normal and syphilitic sera; and although this precipitating power was rapidly lost when the serum was kept at room temperature, it was still found undiminished in the globulin fraction of the serum when this was separated after several days.

Cruikshank found that globulins produced a totally different form of reaction in the gold-sol from that produced by electrolytes, peptone, and other chemical reagents, and that globulin may even inhibit the action of electrolytes. He also found that "the addition of small amounts of acid to paretic fluids increases the zone of precipitation, while the addition of alkali decreases it. Acid solutions of gold-sol tend to show precipitation with negative fluids, and distinctly alkaline ones are not sensitive to paretic fluids".

He concludes that "the reaction in syphilitic diseases of the nervous system depends on a physical change in the globulin associated with increased positive electric charge, and that the zone reactions depend on the relative amounts of globulin and albumin, the globulin having a precipitating action and the albumin a protective one".

J. G. GREENFIELD.

[158] The cerebrospinal fluid in cases of spinal compression (Der Liquor cerebrospinalis bei Rückenmarkskompression).—RAVEN. *Deut. Zeits. f. Nervenhe.*, 1920, lxxvii, 55.

THE author's paper is based on the examination of some 145 cases (personal and from the literature) of compression of the spinal cord, of which 24 were cervical, 58 dorsal, 31 involved the conus medullaris or the cauda equina, 13 were cases of diffuse compression, and in 19 the exact localization was not obtainable. The chief conclusions may here be briefly quoted:

1. Increase in the albumin content without other pathological change in the fluid is a not infrequent accompaniment of intramedullary tumours. It is, further, rather more frequent in extradural than in intradural cases.

2. Xanthochromia is not of itself pathognomonic of compression of the lowest cord segments; but its frequency diminishes in proportion as the level of the lesion mounts higher in the cord, whereas the reverse is the case with the increased albumin content, the latter diminishing in proportion as the compression level descends.

3. Xanthochromia is not of value in distinguishing an intramedullary

from an extramedullary tumour. The more rapid and more severe the compression, the more rapidly does xanthochromia appear.

4. Spontaneous coagulation has hitherto been chiefly observed in cases of extramedullary but intradural tumours.

5. The position of the compression bears no relation to the intensity of the changes in the fluid, nor has the nature of the compressing tumour any bearing upon these changes.

S. A. K. W.

[159] **Enormous excess of albumin in the cerebrospinal fluid in a case of coagulation en masse** (Hyperalbuminose énorme du liquide céphalorachidien dans un cas de coagulation massive).—A. SOUQUES and P. LANTUÉJOL. *Revue neurol.*, 1920, xxvii, 137.

THE authors present a new case of Froin's syndrome. The case was that of a soldier, age 27, whose illness began with sphincter trouble in 1913 and led to his being invalided from the army in the same year. His initial symptoms, together with lumbar pain on exertion, remained stationary till 1917, when he recovered sufficiently to be returned to his dépôt. Subsequently he developed pains in the right lower limb, then in the left, and was finally evacuated to the Salpêtrière in September, 1919.

Examination revealed weakness of the left lower limb, more especially in toe movements, plantar flexion, and flexion at the knee. There was complaint of shooting pains in the left leg, and a dull aching in the lumbar region extending into both lower limbs. Superficial sensibility on the left side was impaired in the area supplied by L4, lost in that covered by L5 to S5; on the right, impaired in the field of S3, lost in that of S4 and S5. The left knee-jerk was feeble, both ankle-jerks lost; the plantar responses both flexor, but very feeble on the left. Micturition and defecation were difficult, and the genital functions were impaired. There was some rigidity of the lumbar vertebræ, but no deformity, and x-ray examination was negative. The Wassermann reaction in the blood was strongly positive.

Lumbar puncture was performed five times between Sept. 15, 1919, and Jan. 4, 1920; the fluid obtained was under low pressure, clear, and of the colour of urine. Allowed to stand for fifteen minutes, it formed a solid clot in the test-tube. Microscopic examination performed on four occasions before coagulation showed absence of red cells, and the presence of 2 to 20 lymphocytes per c.mm. The fibrin and albumin content were estimated quantitatively on two occasions, the higher figures being for fibrin 2.75 grms. and for albumin 42.85 grms. per litre. Immediately after the last puncture made at the usual site, the needle was reinserted between the 9th and 10th dorsal vertebræ: the fluid obtained was clear and colourless, with normal cell content and 0.45 gm. of albumin per litre.

The patient made no improvement under intravenous arsenical medication, and the differential diagnosis between meningovascular syphilis and spinal caries remained uncertain.

The writers call attention to the difference between the fluids obtained from low and high punctures, and to the enormous quantity of fibrin and albumin present, which is greater than in any case yet recorded.

C. P. SYMONDS.



- [160] **Cerebrospinal fluid in experimental compression of the spinal cord.**—J. B. AYER. *Arch. of Neurol. and Psychiat.*, 1919, ii, 158.

By injecting with paraffin the epidural space in cats, the author succeeded in producing symptoms of partial transverse myelitis. Investigation of the cerebrospinal fluid by lumbar puncture below the area of compression showed an almost constant increase of its protein content: in some cases the changes were entirely comparable with the *syndrome de coagulation massive et de xanthochromie* of Froin, while other fluids conformed to the condition described by Nonne—a moderate or considerable increase in protein content of the spinal fluid, without xanthochromia, increase of cells, or clotting. Fluid taken from above the site of compression was uniformly normal, or almost normal.

As there is often a well-marked vascular engorgement of the pial vessels below the area of compression, it is probable that the pathological process operating in the formation of these abnormal fluids is not hæmorrhage, but transudation into the lumbar sac.

R. M. S.

- [161] **Meningeal infection from circulating organisms** (Sur l'infection expérimentale des méninges par des germes contenus dans le sang circulant).—L. H. WEED. *Arch. méd. Belges*, 1920, lxxiii, 1.

THE author, experimenting by the injection into animals of various bacteria, has found that a lumbar puncture, practised after such a septicæmia had been experimentally induced, resulted in a rapid appearance of meningitis due to these circulating germs. This was not the result of infection via the puncture, as the meningitis started in the brain and spread from above downwards instead of from below upwards. The auto-infection is attributed to the lowering of cerebrospinal pressure. The same result was produced by causing a venous stasis in the cerebral vascular system through compression of the jugulars and by injecting hypertonic saline intrathecally. It seems, therefore, that there are great risks of auto-infection of the meninges when lumbar puncture is performed on a case where organisms are circulating in the blood-stream (cf. this Journal, No. 2, p. 188, Abstract No. 79).

J. E. NICOLE.

- [162] **The colloidal-gold reaction in four hundred and ninety-eight psychiatric cases.**—EVA RAWLINGS. *Arch. of Neurol. and Psychiat.*, 1919, ii, 180.

ALL the patients on whom the colloidal-gold reaction was performed had symptoms or histories suggestive of neurosyphilitic infection, and no case was punctured which did not show either a positive Wassermann reaction in the blood-serum, or neurological signs which made dependence on a negative serum inadvisable. The following results were obtained from the gold test on the cerebrospinal fluid of the 498 cases: 103 gave parietic curves with positive Wassermann reactions of either serums or spinal fluids or both; 10 gave suggestive curves of incipient dementia paralytica with negative Wassermann reactions of serums and spinal fluids; 53 gave syphilitic curves with positive Wassermann reactions of either serums or spinal fluids or both; 118 gave syphilitic curves with negative Wassermann

reactions of serums and spinal fluids: 209 gave negative gold reactions, 14 of which showed positive Wassermann reactions of the serums, and 3 positive Wassermann reactions of the spinal fluids: 5 gave atypical curves, several of these being treated cases. The reaction was found of value in clearing up the etiology of old arteriosclerosis with negative Wassermann reaction: necropsies having demonstrated a syphilitic type of vascular lesion in cases giving syphilitic curves, and a simple senile degeneration of the vessels in cases giving negative gold reactions.

Five cases of Huntington's chorea gave negative gold reactions, although in one there was found at the autopsy an inactive tabetic involvement of the lumbar cord.

R. M. S.

[163] **Concerning the colloidal-mastic test.**—J. M. STANTON. *Arch. of Neurol. and Psychiat.*, 1920, iv, 301.

AN investigation to determine the degree of parallelism between the colloidal-gold and the colloidal-mastic reactions.

The reagent is prepared as follows: 10 grms. of gum mastic are dissolved in 100 c.c. of absolute alcohol, and the resultant cloudy solution is filtered several times until a brilliant straw-coloured fluid is obtained. From this stock solution 1 c.c. is added in a test-tube to 9 c.c. of alcohol: 40 c.c. of distilled water are placed in a small Erlenmeyer flask, the mastic solution in alcohol is rapidly added, and the whole gently mixed by rotation.

When the test is to be performed, ten small test-tubes are set up in a rack. In the first there is placed 1.5 c.c. of the salt solution (99 c.c. of 1.25 per cent sodium chloride solution plus 1 c.c. of 0.5 per cent potassium carbonate solution), and in each of the remainder 1 c.c. Five-tenths c.c. of the spinal fluid is next added to the first tube, and, after mixing, 1 c.c. is transferred to the second tube, and so on. To each of the ten tubes 1 c.c. of the mastic emulsion is added, and, after being shaken to secure even distribution, they are allowed to stand overnight, and are then read. The degree of precipitation of the mastic is expressed numerically: 1, denotes a milky fluid, loss of opalescence, and a very slight precipitation; 2, a distinct precipitation, but with a milky supernatant fluid; 3, a marked precipitation, with a slight cloudiness of the fluid above; 4, complete precipitation of the colloid.

From an examination of 100 fluids by both tests, Stanton concludes that the information gained from the mastic test is in close agreement with that obtained from the colloidal-gold test. The results obtained from fluids kept longer than forty-eight hours are of doubtful value, and cerebrospinal fluid containing blood is entirely unsuited for the mastic test. Certain samples of mastic are unsatisfactory, and it is only by actual trial that a suitable specimen can be obtained.

R. M. S.

[164] **The plurality of the syphilitic virus** (Pluralité des virus syphilitiques).—LEVADITI and A. MARIE. *Presse méd.*, 1920, xxviii, 646.

IN this somewhat controversial paper the authors recapitulate their views on the plurality of the syphilitic virus. Their conclusions are based on

their own experimental work with the spirochaete obtained from cases of general paralysis. They have been struck with constant differences in the lesions produced by this spirochaete in rabbits, as compared with those produced in the same animal by the inoculation of spirochaetes from chancres and papules.

The neurotropic virus differs from the dermatropic virus by: (1) The peculiar nature of the lesions which it causes in the rabbit (squamous papules instead of orchitis and hard chancre); (2) The extremely long incubation period; (3) Its affinity for epithelial cells; (4) The slowness of the tendency to spontaneous healing; (5) Its virulence in man and the ape; and (6) The fact that animals which have been infected by the neurotropic virus, and been cured and vaccinated against that virus, can become infected with the dermatropic virus, and vice versa. In a word, the spirochaete isolated from cases of general paralysis is not biologically identical with that obtained from the chancres and mucous plaques of ordinary syphilis. The authors are inclined to the view that the spirochaete responsible for general paralysis has at the outset a marked neurotropic tendency, and does not develop this merely after a prolonged intracerebral existence.

S. A. K. W.

[165] Recent experimental investigations on the etiology of disseminated sclerosis.—C. DA FANO. *Jour. Nerv. and Ment. Dis.*, 1920, li, 428.

THE author reviews some of the earlier experimental work on disseminated sclerosis, especially that of Bullock in 1913. This observer found that by injecting cerebrospinal fluid of a well-marked case into the region of the sciatic nerve of a rabbit severe spinal symptoms developed, which on post-mortem examination proved to be due to a general oedema of the cord, accompanied by a degeneration of the myelin sheaths, and swelling of the nerve-cells in certain defined regions. Other rabbits showed similar symptoms, but recovered, and one other, which died, showed extensive areas of degeneration in the cord. In 1918 Simons confirmed the observations of Bullock, obtaining symptoms of paralysis in two rabbits out of six injected intradurally with cerebrospinal fluid from a patient with disseminated sclerosis, though fluid from another patient gave consistently negative results. In 1917 Kuhn and Steiner found that positive results were best obtained by mixtures of blood and cerebrospinal fluid diluted with sterile physiological saline solution, in proportions of 1:1, 1:3, and 1:5, introduced intra-ocularly in rabbits and intraperitoneally in guinea-pigs. The animals became ill in from three to twelve weeks, and died with symptoms of paralysis and involvement of the central nervous system. As in the experiments of Bullock and Simons, they found that all the animals were not equally susceptible, but out of the material from two different patients they obtained one set of four successful passages through guinea-pigs, and one set of two through rabbits, with equal severity of symptoms. Post mortem these authors found no macroscopic changes except congestion of the liver. In the blood-films, however, they found a spirochaete by

dark-ground illumination, though the cultures were negative. This was also seen in the capillaries and blood-vessels of sections of liver tissue.

In 1918 Siemerling discovered living spirochaetes, similar to those found by Kuhn and Steiner, in foci of cerebral necrosis examined by dark-ground illumination two hours after death, in a patient with distinct but mild disseminated sclerosis who died of intercurrent erysipelas. In 1919 Marinesco further confirmed this work by recovering similar spirochaetes from the cerebrospinal fluid of two guinea-pigs which had been inoculated with fluid from cases of disseminated sclerosis and which had begun to show symptoms of affection of the central nervous system.

In 1918, Strümpell criticized the theory of the infective origin of disseminated sclerosis on the grounds that this could not be easily reconciled with what has long been known as to the onset, clinical course, and pathology of the disease. He himself, however, admits the theory of infective origin as possible, but considers that a great deal more confirmatory work must be done before it can be established. The author points out that the disease may be due to a toxin elaborated by the spirochaete as well as to the spirochaete itself, in view of Bullock's observations on the potency of the fluid after prolonged exposure to cold and passage through a porcelain filter. In any case the results so far obtained point to a splendid field of work for future investigations.

R. G. GORDON.

- [166] Some points in the pathological physiology of Jacksonian epilepsy following gunshot wounds of the head (Quelques faits de physiologie pathologique touchant l'épilepsie jacksonienne consécutive aux blessures de guerre).—LERICHE. *Presse méd.*, 1920, xxviii, 645.

THE author has observed certain points which may turn out to be important in connection with Jacksonian epilepsy after gunshot wounds of the head. For an investigation of the phenomena he finds it desirable to examine under a local anæsthetic, with the patient in a seated position. The tension of the cerebrospinal fluid is very different when the patient is seated from what it is in the recumbent position, and the author has found that it is easy, after opening the dura, to observe the cerebrospinal fluid and the cerebral convolutions through the arachnoid. He has noticed on several occasions that the onset of a Jacksonian fit is immediately preceded by an arrest of cerebral pulsation and by instantaneous blanching of the pial vessels at the same moment. Another observation made under similar circumstances is that in a large number of Jacksonian cases the tension of the fluid is below rather than above the normal. In fact he attributes to hypotension not a few of the symptoms of cases of head wound, and has been able to effect material improvement in these symptoms by the daily injection of 150 c.c. of artificial serum underneath the skin, a procedure which leads rapidly to elevation of the tension of the cerebrospinal fluid. A third point has a bearing on the empirical adoption by the patient of the old plan of grasping the affected Jacksonian limb firmly at the commencement of an attack. Leriche has found that in the affected arm



of one of his Jacksonian patients the brachial artery was in a condition of persistent over-dilatation. By suitable ligature he was able to relieve many of the subjective cramps, pains, and paræsthesiæ of which the patient complained in the affected arm. In other words, a scientifically conducted vasoconstriction produces an ameliorating effect analogous to that brought about when the patient grasps his arm himself.

S. A. K. W.

- [167] **Defects of cerebellar structure** (Zur Kenntnis der Bildungsfehler des Kleinhirns).—R. BRUN. *Schweiz. Arch. f. Neurol. u. Psychiat.*, 1918, iii, 13.

THIS paper forms the last of several long contributions to a difficult subject published by the author in earlier numbers of the same archives. It is based on the minute anatomical examination of a considerable number of cases of cerebellar defect, and some of the general conclusions may be quoted.

The great majority of cases of cerebellar aplasia or dysplasia are associated with developmental anomalies in other parts of the central nervous system, and are to be attributed to primary arrests of the developing germ-area at one or other phase of normal ontogeny. Such arrest may be caused by hereditary factors, as in the various forms of familial cerebellar disease, in which histological evidence of such embryological arrest is nearly always forthcoming, or by toxic injuries to the germ-stuff during foetal life, of endogenous or exogenous origin. The effect of toxic action on embryonic tissues is either to eliminate directly numerous structure-forming cells, or to impair the vitality of the surviving elements, inhibiting cellular differentiation or appropriate cell-wandering at the proper stages. The former of these leads to aplasia or hypoplasia, the latter to dysplasia or dysgenesis, i.e., to architectonic anomaly. Since the neocerebellum is differentiated later than the paleocerebellum, its components are apt to suffer most if there be an adynamic error of germ-development; hence the cases of 'system-aplasia' frequently met with. Structures functionally related to those suffering from arrest of development may themselves fail to develop secondarily, owing to the absence of 'morphogenic stimulus-action'.

The paper is well illustrated and documented, and there is a full bibliography.

S. A. K. W.

- [168] **Some observations on epileptics and on epilepsy, chiefly from a Röntgen-ray standpoint.**—T. M. T. McKENNAN. *Arch. of Neurol. and Psychiat.*, 1920, iv, 297.

IN a previous communication with G. C. Johnston and C. H. Henninger it was shown that there are apparent deposits of bone in the base of the skull in a large percentage of epileptics. To explain the way in which this deposit occurred, the hypothesis was advanced that a vasomotor disturbance of the anterior lobe of the pituitary gland conditioned a venous hyperæmia in the intercavernous sinuses. The latter constitute the circular



sinus, and are in reality not sinuses but veins. They receive the secretion of the anterior lobe of the pituitary, and the bony deposits in epileptics correspond in situation to the areas they drain. In the present contribution the x-ray findings in 90 cases of epilepsy are tabulated. Bony deposits were found in 57.77 per cent, and in cases of epilepsy originating in persons over thirty-five years of age 88 per cent presented Röntgen-ray evidence of pituitary disorder. The author regards as evidence of pituitary insufficiency what he terms a small or infantile area, and apparently assumes that the formation of the sella turcica goes hand in hand with equivalent changes in the hypophysis. As estimation of the size of the pituitary area is largely a matter of individual experience, it is unfortunate that there are no illustrations of the x-ray findings in this series, to guide the reader in appreciating the abnormal.

R. M. S.

- [169] **Changes in the brain in tetanus** (Hirnveränderungen bei Tetanus). —BOUMAN. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lviii, 301.

THE writer describes the findings in the brain in a case of tetanus which died on the tenth day in spite of treatment by antitoxin. Scattered throughout all regions of the brain, both in grey and white matter, were small lesions consisting of a heaping together of glial cells and nuclei. The latter were of different shapes and sizes, and not a few of the cells showed mitotic figures. In addition, many of the glial cells were joined together into a symplasma. Rod-cells were frequently found arranged in a more or less radial fashion in the immediate vicinity of these collections of glial cells and nuclei, while in the centre of the lesion a blood-vessel was almost constantly discoverable. It was specially noted that no small-cell infiltration of either lymphocytic or leucocytic variety was associated with the presence of the blood-vessel. Investigation failed to reveal any actual tetanus bacilli in connection with these lesions or otherwise. Analogous changes in the central nervous system have been found in the case of other acute infective diseases, notably in malaria and in typhus. The suggestion is that the changes are the direct result of toxic action and not of the presence of bacilli, and it is important to note that they are in no way analogous to glial proliferation which is secondary to disease of nerve cells.

S. A. K. W.

- [170] **Doubling of the spinal cord.**—B. LIPSHUTZ. *Arch. of Neurol. and Psychiat.*, 1920, iv, 16.

CASES of true doubling of the spinal cord appear to be very rare. Bruce, McDonald, and Pirie were able to collect only ten cases from the literature. The specimen obtained by Lipshutz was from an adult male cadaver of unusually good physique. In its caudal portion the spinal cord was divided into distinct symmetrical halves, the two being entirely enclosed in single arachnoid and dural sheaths. The bifurcation began at the lower border of the eleventh thoracic vertebra and extended to the caudal limit of the cord. The dura mater also exhibited a rare anomaly, there being an hour-glass-shaped dural band directed in the sagittal plane and

firmly attached to the ventral and dorsal surfaces of the dura which entered the dorsal median fissure and completely divided the cord. This band appears to have been the factor that produced division of the cord.

R. M. S.

### SENSORIMOTOR NEUROLOGY.

[171] The false localizing signs of spinal-cord tumour.—CHARLES A. ELSBERG. *Arch. of Neurol. and Psychiat.*, 1921, v. 64.

OUR knowledge of the pathways of the fibre tracts and of the localization of functions in the different segments of the spinal cord is now sufficiently defined to permit accurate localization of medullary tumours in a large percentage of cases. Nevertheless, in some patients in whom the symptoms and signs noted at repeated examinations point clearly to a certain level and a definite location, the growth may be found to have entirely different relations to the cord. Elsberg characterizes these as cases with 'false localizing signs', and in the present communication gives an instructive account of two cases.

The first case was that of a woman, who in 1911 presented distinct localizing signs of extramedullary tumour at the 7th thoracic segment: laminectomy (5th to 9th dorsal) was performed, but the operation failed to reveal a tumour, and her condition was not relieved. Three and a half years later the patient was readmitted with symptoms pointing to a tumour at the 7th or 8th cervical segment on the posterolateral surface of the cord. At the operation an endothelioma about one inch long was removed from the posterior surface of the 8th cervical segment.

In the second case spinal symptoms had been present for one year, and suggested a tumour at the 11th thoracic segment. Laminectomy was performed, but no tumour found. Seventeen months later there were localizing symptoms at the 5th thoracic segment; the patient was again subjected to operation, and an extramedullary fibroma was removed successfully at the 4th thoracic segment.

The author has been impressed by the frequency with which patients with spinal tumours in the cervical region first complain of sensory and motor symptoms referable to the lower extremities. He suggests that such anomalous symptoms may be explained on the hypothesis that the spinal lesion causes at first only a partial interruption of fibre tracts, which in the cervical region require five or six segments for their decussation. Hence, if the lesion be at first a small one, the affected fibres may be those that supply areas considerably below the actual level of the lesion, and the zone of sensory disturbance may shift to the true segmental level when the interruption becomes more pronounced.

In the second part of his paper, Elsberg draws attention to errors in interpretation of signs referable to the side and part of the cord affected. In rare instances a tumour on one side of the cord may dislocate the cord to the opposite side to such an extent that the pressure of the cord against the wall of the spinal canal may cause symptoms referable to the side of the cord opposite to that of the tumour. Thus, for example, with ill-

defined Brown-Séquard symptoms, the greatest motor loss may be on the *opposite* side, and the marked sensory disturbances on the *same* side, as the tumour. Such a condition is analogous to that not infrequently seen in tumours in the cerebellopontine angle. Paralysis of the seventh nerve may occur on one side with a tumour in the angle of the other side, because the tumour pushes the cerebellum over to the opposite side, compressing the facial nerve of that side against the petrous portion of the temporal bone. It is especially in patients who give no history of root pains that the growth may be localized on the wrong side of the cord.

Confusion may also arise in patients presenting signs of interference with both posterior columns, for an extramedullary tumour on the anterior surface may press the cord backwards against the arches of the vertebrae, causing symptoms suggestive of a growth on the posterior surface.

In five cases of thoracic-cord lesions of an expanding nature, Elsberg has met with tingling or hyperæsthesia in the fingers of one or both hands; in three an extramedullary tumour between the 4th and 8th dorsal segments was removed by operation, and in all this cutaneous disturbance was found to have disappeared when they had recovered from the effect of the anæsthetic. In one of the patients a large amount of fluid under great pressure escaped from above, as soon as the tumour was removed. Probably, therefore, the tingling in the fingers in these cases was due to a slight pressure on, and irritation of, posterior roots by a column of cerebrospinal fluid above the tumour.

R. M. S.

[172] A contribution to the study of the anæsthesia in compression lesions of the cord in the dorsal region (Contribution à l'étude de l'anesthésie dans les compressions de la moelle dorsale).—J. BABINSKI and J. JARKOWSKI. *Revue neurol.*, 1920, xxxii, 865.

THE authors draw attention to the difficulty commonly experienced in such cases of determining with accuracy the boundaries of the hypæsthetic area. In cases of complete transverse lesion of the cord (myelitis, gunshot wound) there are distinguishable three sensory levels. There is an unequivocal line marking the upper level of the area of complete cutaneous anæsthesia. Above this, extending over an area roughly corresponding to the sensory distribution of a single segment, there is definite hypæsthesia, revealed by errors on the part of the patient in differentiating between the various forms of stimuli (area of marked hypæsthesia); the upper level of this area is distinct. Above this again is a zone of similar width in which the hypæsthesia is quantitative only, i.e., the patient's answers are correct, but the stimuli appear to him to be somewhat dull.

This sensory picture may also be found in the later stages of compression lesions, but in the majority of cases, especially in the earlier stages, there are points of difference.

In compression lesions complete cutaneous anæsthesia (if present) is usually limited in extent and is bounded above, and sometimes below, by areas of hypæsthesia in which the most striking features are the inconstancy and variability of the sensory defects. Thus in the course of a single

examination, stimulation of areas which at one moment appear anæsthetic may later evoke a response, an inconsistency which in the authors' opinion is not adequately accounted for by wandering of the patient's attention. This 'unstable anæsthesia' may extend to a considerable height above the upper level of constant sensory defect, and the latter corresponds with a segmental level well below that of the compression. The area of 'marked hypæsthesia' in these cases may be of wide extent and, increasing in degree from above downwards, may shade insensibly into total anæsthesia. In addition, careful examination of the areas supplied by the lower lumbar and sacral roots frequently reveals a similar zone of hypæsthesia below the level of maximum loss. These points may be of value in differentiating a compression lesion from an intramedullary tumour in which the sensory loss is most marked at the level of the growth.

The error most commonly made in the localization of spinal tumours is that of assuming the level to be lower than is afterwards found to be the case. This is probably due to a failure to recognize the importance of the hypæsthetic zones, in which the tenuous nature and variability of the loss have been explained by assuming it to be caused by œdema of the cord above the lesion.

The authors believe that the upper limit of the zone which they have called that of marked hypæsthesia is the best guide to the level of the lesion, and report that up to the present it has not failed them in the exact localization of tumours compressing the spinal cord. Several figures in the paper, representing the sensory findings in different cases, illustrate clearly the points emphasized.

C. P. SYMONDS.

[173] **Traumatic softening of the spinal cord** (*Le ramollissement traumatique de la moelle*).—II. CLAUDE and J. LHERMITTE. *L'Encéphale*, 1920, xv, 1.

THREE cases of gunshot wound of the spinal cord are described in which softening extended some distance above and below the level directly implicated in the wound.

*Case 1* is that of a Zouave who was wounded by a revolver bullet in March, 1917, and three months later presented complete paraplegia in extension, with no voluntary, reflex, or automatic movements of the lower limbs. He had complete anæsthesia below the 10th dorsal segment, with syringomyelic loss of sensibility above this level up to D 6. At the autopsy the cord was found to be adherent to the 6th and 7th dorsal vertebræ, but no bony lesion was found. On further examination the dura mater showed a yellowish discoloration at the level of D 9, and ascending degeneration could be traced from D 10 upwards. At the level of D 8, the anterior and posterior horns on the right side contained a cavity surrounded by walls of firm white sclerotic tissue. Below D 10, down to the conus terminalis, the substance of the spinal cord was soft and dilluent, and no distinction could be made out between white and grey matter. In fact, the contents of the pia mater flowed out as a thin porridge on section of the surface of the cord.



Histological examination showed that the softening extended almost to the upper end of the dorsal cord, and was very extensive in the mid-dorsal region.

*Case 2* is that of an infantryman wounded by shrapnel in September, 1915. Three weeks later he was found to have complete paraplegia, with loss of all forms of sensibility below D11, and complete loss of all the superficial and deep reflexes of the lower limbs and abdomen. X rays showed a fracture of the 11th and 12th dorsal vertebrae, and a shrapnel ball in the left side of the thorax near the 11th rib. A laminectomy was performed at the beginning of November, when the dura mater was seen to be thickened; but it was not opened. The patient survived his wound for more than a year, without any return of reflex or automatic movements in the lower limbs.

At the autopsy the dura mater was adherent to the vertebrae in the region of the wound, and the cord was found completely flattened at the level of D12. Sections showed it to be completely softened from D10 to L5; below this level it was possible to make out the anterior and posterior mesial fissures, and in the sacral region a few motor-cells and the ependymal-cells surrounding the central canal could be distinguished.

*Case 3* is that of an infantryman wounded in September, 1915, by a shell-fragment which lodged in the region of the 10th dorsal vertebra. Four months later he was found to be completely paraplegic, with entire loss of all forms of sensibility below L2 on the right side and S1 on the left. Thermal sensibility also showed diminution over L4 on the left. The right lower abdominal reflexes were absent, as also were all the superficial and deep reflexes of the lower limbs. There was diffuse wasting of all the leg muscles, incontinence of faeces, and overflow incontinence of urine.

At the autopsy in October, 1916, the dura mater was found adherent to the posterior surface of the body of the 10th dorsal vertebra. The whole of the lumbar enlargement was bruised, but was not adherent to the meninges. On section, the upper lumbar segments showed very extensive softening, which diminished in severity on passing downwards to the sacral region. Above this, extending as high as D8, was a sort of necrosis of the anterior horns and the tissue surrounding the central canal, which could be seen under a low power as small losses of substance—a condition resembling that seen in acute poliomyelitis. The motor cells were destroyed, and the nerve-fibres broken or moniliform. At the level of D12 this destruction of the anterior horns could be seen with the naked eye.

The authors make no suggestion as to the cause of this diffuse softening. From the clinical facts given it appears to have come on soon after the wound.

J. G. GREENFIELD.

[174] **A case of myasthenia gravis** (Etude clinique, physiopathologique, et anatomique, d'un cas de myasthénie paralytique).—HENRI CLAUDE and RENÉ PORAK. *L'Encéphale*, 1920, xv, 425.

THE case reported is that of a man of 53, who began in 1912, after an attack of influenza, to suffer from transient diplopia, followed soon after by ptosis



and general fatigue. These symptoms were slight in the morning, but increased toward afternoon and evening, and in the course of the first two months tended to become more constant. On examination, little abnormality could be made out, with the exception of double ptosis and a tendency to nystagmus. The muscles affected did not show the myasthenic reaction. The patient was treated with suprarenal extract and pituitary extract by the mouth, later by injections of suprarenal extract or adrenalin every second or third day, and improved considerably, having less ptosis and less frequent diplopia. His condition remained otherwise unchanged till December, when the myasthenia increased in the eye muscles, and involved in addition those of the palate and mouth, so that he had difficulty in articulating, and sometimes regurgitated liquids through the nose. He died in January, 1913, after a short attack of influenza.

At the autopsy the most conspicuous feature was a tumour of the thymus, partially cystic, about the size of a goose's egg, weighing 15 grms., lying over the base of the heart and the origin of the great vessels. The thyroid gland was normal, but all four parathyroids were enlarged to the size of large peas, and of a rose-red colour. The pituitary also was enlarged, especially its posterior lobe.

Histologically the mediastinal tumour was found composed partly of lymphoid tissue and partly of epithelial cells, which surrounded cavities of all sizes, some containing fibrin, others red and white blood-cells. Structures resembling Hassall's corpuscles were found in some parts of the tumour, which the authors consider to be an epithelioma of the thymus. The thyroid gland showed a tendency to atrophy, with a slight degree of increase of interstitial cells; in the parathyroids, apart from normal cells, an abnormal development of eosinophil cells, in some places forming solid masses, was found. There was also colloid-formation between the cells. The enlarged posterior lobe of the pituitary contained many pigmented cells, the pigment, seemingly a lipid, appearing as brownish granulations. In the anterior lobe there was an abundance of colloid and of chromophil cells. Both lobes were greatly congested. No definite changes were found in the cells of the nervous system, although those of the cranial motor-nerve nuclei did not stain well with Nissl's method, and appeared sparser than normal. The muscles showed little change, though some fibres were fissured longitudinally and others thinner than normal; and the nerves were unaffected. No foci of lymphocytic infiltration were found.

The authors lay emphasis on the changes in the endocrine organs, especially the thymus, parathyroids, and pituitary. It seems probable the tumour of the thymus was primary, and the changes in the other organs were secondary; but in the paucity of our knowledge of the functions of the thymus it is impossible to be precise in the relationship between the two factors. The changes in the parathyroids and posterior lobe of the pituitary were suggestive of increased activity, and the authors suggest that this hyperfunction may have led eventually to functional exhaustion, which was hastened by the fatal attack of influenza. They enter a plea that cases of myasthenia should be subjected to a more complete examina-

tion as regards the functional activity of the endocrine organs, and that more experimental work should be done on the relationship between these organs and the motor system.

J. G. GREENFIELD.

- [175] On myatonia congenita and infantile progressive spinal amyotrophy (Ueber Myatonia congenita und infantile progressive spinale Muskelatrophie).—SLAUCK. *Deut. Zeits. f. Nervenh.*, 1920, lxxvii, 1.

THE exact pathological position of the interesting disease of childhood, called by Oppenheim myatonia congenita, has never been precisely established, largely owing to the paucity of pathological reports. The author has had the opportunity of examining no fewer than eleven cases of the disease, of which five occurred in one family. One of the arguments in favour of the individuality of myatonia congenita has been the absence of familial cases, but these reported by Slauck prove that the disease may occur in a heredo-familial form like any of the ordinary myopathies. He has further given a complete pathological report on one of his cases in which the chief findings were a primary non-inflammatory degeneration of the cells of the anterior horns of the cord and of the hypoglossal nuclei, with degeneration in the motor roots corresponding, in the motor fibres of the peripheral nerves, and in the muscles. The pathological condition is, in a word, similar to what is found in ordinary progressive muscular atrophy, and in particular is practically identical with what occurs in the infantile or Werdnig-Hoffmann form. He quotes the opinion of Professor Hoffmann apropos of the cases herein reported that "myatonia congenita is not a special form of infantile progressive spinal muscular atrophy, but is it itself". On the other hand, he will not admit that every case of myatonia belongs to the Werdnig-Hoffmann group, believing that other conditions are sometimes included under the term.

S. A. K. W.

- [176] Spirochætes in disseminated sclerosis (Spirochätenbefund bei multipler Sklerose).—BÜSCHER. *Arch. f. Psychiat.*, 1920, lxxii, 426.

THE patient was a woman, age 45, whose case was diagnosed as disseminated sclerosis of the spastic paraplegia variety. There was a long history of illness with characteristic remissions. The Wassermann test was negative both in the blood and fluid: further, there was in the latter a very slight lymphocytosis, and, with the gold-sol test, a curve like that of G.P.I. At the post-mortem many small disseminated lesions were found in the brain varying in size from a pin's head to a millet seed. From a number of these, especially in the white matter of the postcentral gyrus, spirochætes were obtained fifteen and thirty-nine hours after death, and readily seen by the method of dark-ground illumination. They seemed rather short and shrunken, and differed somewhat in this respect from the *Spirochæta pallida*. On the other hand, however, the author failed to detect them by ordinary silver methods of staining in hardened material from the brain.

On the whole, it seems fairly certain from the author's description that the case was, in reality one of disseminated sclerosis, but, in view of its possible importance, further details would have been desirable.

S. A. K. W.

[177] A case of diffuse endothelioma of the pia arachnoid—J. H. HARVEY PIRIE. *Med. Jour. of S. Africa*, 1920, xv, 157.

THE case described is that of a young European who complained first in April, 1919, of difficulty in swallowing, followed three months later by weakness, headaches, and a feeling of numbness on the left side of the face and neck, with loss of sensibility in the left cornea and slight paresis of the left face. Nystagmus was present, both to right and left; the patient was so giddy as to be unable to walk; bilateral papilloedema was found. A decompression operation was performed, and the left lateral ventricle tapped, but the patient only survived the operation a few days.

At the autopsy little was seen except thickening of the pia arachnoid over the greater part of the base of the brain. Sections showed this to be due to infiltration with endothelial cells, which had also densely infiltrated several of the nerve-roots, and in some places invaded the brain substance along the perivascular sheaths of the vessels. No gross tumour-mass was found, nor did the cells present any characteristic mode of arrangement, e.g. in whorls.

In discussing the nature of the infiltration the author takes the view that it must be regarded as a tumour-growth derived from the endothelial cells lining the spaces of the arachnoid.

J. G. GREENFIELD.

[178] The excitomotor syndrome of epidemic encephalitis; its principal manifestations: rhythmic chorea, the bradykinetic, myoclonic, and Parkinsonian types of movement (Le syndrome excitomoteur de l'encéphalite épidémique).—PIERRE MARIE and Mlle. GABRIELLE LÉVY. *Revue neurol.*, 1920, xxvii, 513.

THIS valuable paper is a mine of detailed clinical observations made upon cases of encephalitis. Reviewing their experience of the disease, the authors divide their cases into three chronological periods: July to November, 1918; January, 1919, to January, 1920; and January to June, 1920—corresponding with three waves of the epidemic—and describe certain new features in the latter cases.

They classify the involuntary movements under six headings:—

1. *Choreic*.—The movements differ from those of ordinary chorea in being on the whole less irregular and more rhythmic. A case in illustration is described in detail, that of a woman, age 40, whose choreic movements developed three months after an ill-defined febrile attack, and were confined to the face, and the limbs of the left side: they were in a sense the only evidence of the nature of the original infection. Another variety in this group is described under the title of 'rhythmie salutation': the patient quoted in illustration developed, four months after his original illness, rhythmic co-ordinated movements, as of one attempting to pick

up objects from the ground, or bowing as he walked, the effort to the observer appearing ridiculous. Other cases of this type were observed, one in a patient who had been in hospital previously for an undoubted attack of encephalitis lethargica.

2. *Slow Oscillations of Large Amplitude*.—These are slow, regular, rhythmic movements of large amplitude, predominating at the proximal joints of the limbs, sometimes being synchronous in the two limbs on one side of the body.

3. *Myoclonic*.—Movements of this type are not uncommon. They disappear in the course of a few weeks, but leave the muscles in a state of increased mechanical and electrical excitability.

4. *Parkinsonian*.—The case is quoted of a patient, age 41, who was first observed at the time of the initial illness in April, 1918, and followed to the development of a complete Parkinsonian picture in March, 1920. Under this heading the authors describe an abortive and a progressive type. In the former, tremor is the predominant symptom; in the latter, rigidity.

5. *Encephalitis with Tremors*.—These are usually localized and transient, and do not conform to any special type.

6. *Movements Confined to the Face*.—These may take the form of irregular tremors, or rhythmic clonic contractions. The muscles of the face, jaws, and tongue may be involved singly, or more commonly together, and the movements may be accompanied by pain in the trigeminal field. A case is recorded in detail in which, in addition to the above symptoms, trismus was a marked feature.

Included in the symptomatology of epidemic encephalitis are a whole series of motor phenomena, involuntary movements, or Parkinsonian syndromes, which may be summarized as the excitomotor syndrome. The time relations of this syndrome may vary: (1) It may be an early transient manifestation of the disease; (2) It may appear early and remain long; (3) It may make its appearance about a week after the onset; (4) There may be an interval of two or three months (sometimes six months) between the initial attack of encephalitis and the appearance of the movements.

This excitomotor syndrome in one or other form may be the most striking, if not the only, manifestation of an attack of encephalitis.

As to the duration of the movements, in the cases resembling ordinary chorea they usually disappear in a few months; movements of the rhythmical, localized choreiform type may persist as long as eighteen months and leave some weakness; those shown in the so-called 'rhythmic salutation' may last eighteen months, and are usually accompanied by general mental and physical deterioration.

The movements of the type designated bradykinetic disappear, as a rule, after about six months.

In the cases in which the involuntary movements appear after a considerable latent period, the diagnosis may be extremely difficult on account of the absence of positive neurological signs; moreover, the cerebrospinal fluid at this stage shows no abnormality. It is therefore important to be



able to recognize in the history a preceding attack of encephalitis, bearing in mind that the severity of the initial attack bears no relation to that of the subsequent excitomotor syndrome. The writers consider that while an attack of encephalitis is usually associated with fever, it may run an afebrile course. They lay stress on the value of a history of somnolence, or insomnia, ocular palsies, occipital headache with neck stiffness, disturbances of mastication, facial spasms, excessive salivation, dysarthria, fibrillation of the tongue, choking sensations, gasping, hiccough, respiratory disturbances, pain and swelling of the joints.

Sensory disturbances may be a prominent feature. These may take the form of lancinating pains, areas of cutaneous hyperæsthesia, or pain and sensation of stiffness in the muscles, especially those concerned in the involuntary movements.

The authors conclude with the hope that further studies of the excitomotor syndrome in epidemic encephalitis may throw light on the functions of the basal ganglia and mid-brain, and upon the physiology of involuntary movements in general.

C. P. SYMONDS.

- [179] The mechanisms for speaking, music, and reckoning, and their cerebral localization (Ueber Sprach-, Musik-, und Rechenmechanismen und ihre Lokalisationen im Grosshirn).—S. E. HENSEN. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1919, lii, 273.

PROFESSOR HENSEN'S paper does not lend itself to brief abstracting, but some indication of his position may be attempted. He avows himself a strong supporter of the clinico-anatomical method, and thinks the existing confusion in the doctrine of aphasia and kindred conditions is largely due to failure to follow this well-tried line of investigation. Elaborate psychological schemes to explain the phenomena of aphasia have been erected on anatomical ignorance. It is imperative to base the clinical facts on anatomical examination, and, further, to seek data throwing light on the localization of psychical function.

The literature now contains, according to Hensen, no less than some 1500 cases of aphasia with pathological examination. From a consideration of the material it may be concluded that the speech mechanism is an anatomico-physiological unity, with two receptive and two motor foci, which are all relatively independent, but in which disturbance of one may upset the function of others.

In the case of the musical faculty, there are analogous foci and analogous types of clinical disorder—tone-deafness, note-blindness, inability to sing (avocalia), and note-agraphia and instrumental amusia (music-apraxia). The same is true of the reckoning faculty. Numerous figures are cited from a collation of the literature which go to show that the corresponding defects of word-blindness and note-blindness, say, though often occurring together, need not so be simultaneously involved, and this is the case also with the other corresponding couples. As an instance, it may be stated that of 121 patients with complete motor aphasia, no fewer than 84 could sing known melodies more or less correctly; while



of 65 patients with complete word-deafness, only 20 were also tone-deaf. Henschen adduces much evidence in connection with the localization of speech, music, and reckoning foci or centres, which follows the classical scheme more or less, and for the details of which the original should be consulted.

While the various centres and association-paths in relation thereto, for speaking, music, and reckoning faculties respectively, constitute units to which psychical unities correspond, there are frequently dissociated 'function-complexes' within them. Thus, the power of speaking in one language may be lost, but in another retained, etc.; the case of a patient is quoted who lost his ability to recognize tone pitch on the printed page of music, but still knew the length of notes; and so on. Attention is paid to the acquisition of psychical function-complexes by training and education, which in their turn become automatism and, losing their conscious element, sink into the 'latent mind-life'. There is evidence localizing, more especially in the right hemisphere, these psychical automatisms, which play a very important rôle in everyday experience, and form essential elements in the psyche. On the other hand, the left hemisphere is more concerned with logical thinking and the elaboration of material received from sense-organs.

S. A. K. W.

[180] Observations on Kisch's reflex in injuries of the skull (Beobachtungen über den Kischchen Reflex bei Schädelverletzungen). WINTER and GÖTZ. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lviii, 281.

IN 1918 Kisch described the reflex which bears his name, and summarized his observations as follows: On mechanical or caloric stimulation of the deeper parts of the external auditory apparatus, there occurs in the normal man a reflex closing of the lid, and in 50 per cent of cases a copious flow of tears. When the fluid enters, drop by drop, the lid never remains closed longer than four seconds—with prolonged irrigation never more than eight seconds. Complete absence of the reflex, or great prolongation after cessation of the stimulus, was never observed in 150 healthy controls. When it is absent, the pupil often dilates and the upper lid is sometimes retracted. It is not found in lesions of the fifth and seventh cranial nerves, and in many organic diseases of the nervous system. In 23 cases of hysteria and 12 of dementia præcox, it was absent once in each group.

In a later paper Kisch gave his results in cases of head injury. In patients with severe bone lesions the reflex was very often absent on both sides, sometimes only on the side opposite to the lesion. Patients who had suffered from commotio cerebri without gross injury to the skull often showed absence of the reflex on one side and prolongation on the other. Of 46 cases examined, only 12 gave a normal response.

Winter and Götz examined a large number of patients free from organic nervous disease, and 26 cases of head injury. They found that in cases of hysteria and in mild forms of insanity the reflex was always obtained.

Absence of the reflex on repeated examination is strong evidence of organic disease. Prolongation of the reflex is common in nervous and hysterical patients. The free flow of tears and dilatation of the pupil described by Kisch were rarely seen.

W. J. ADIE.

- [181] Significance of facial pain in determining the location of intracranial tumour.—W. B. CADWALADER, *Arch. of Neurol. and Psychiat.*, 1920, iv, 182.

As the Gasserian ganglion lies on the anterior surface of the petrous portion of the temporal bone, it is seldom encroached on by fibromatous tumours growing from the acoustic nerve in the cerebellopontine angle. Hence deafness is not an early symptom in neoplasms of the ganglion, but pain and anaesthesia of the face appearing early, and preceding the onset of deafness, have a diagnostic significance that is not always appreciated.

In the case reported, pain in the face followed by anaesthesia in the fifth-nerve distribution was the most striking clinical symptom, and proved to be an important localizing sign. There were no symptoms of increased intracranial pressure, and tinnitus and partial deafness were late in development. A diagnosis of intracranial tumour growing from the region of the Gasserian ganglion was made. At the necropsy a tumour was found embracing completely the root of the trigeminal nerve; it extended downwards and backwards almost to the foramen magnum, and had also involved the temporal bone. Microscopical examination revealed the characteristic appearance of a chondroma.

R. M. S.

- [182] A systematized disease of the cerebellum (Eine Systemerkrankung im Kleinhirn).—JELGERSMA, *Jour. f. Psychol. u. Neurol.*, 1919, xxv, 42.

THE patient was a man of 83, who for the previous eight years had shown a progressive generalized ataxia involving all the skeletal musculatures, without paralysis and with no sign of pyramidal disease. A diagnosis of cerebellar atrophy from arteriosclerosis was made, but at the autopsy no such atrophy was found, the organ being of normal size. Microscopically, however, over the whole cerebellum gross deficiency of the Purkinje cells, amounting in many places to complete absence, was revealed, their place being taken by moderate increase of glial cells, some of which in their turn had degenerated. No other change in the cerebellum could be discovered.

The case is of interest in showing that the whole function of that organ can be disturbed by a lesion in one only of its constituent elements; yet this need not be the layer of Purkinje cells, since Jelgersma himself has described the typical cerebellar syndrome in three cats where these cells were intact but the granular layer agenetic. Any diffuse lesion of the cerebellum reveals itself in impairment of inco-ordination independently of the elements which are affected.

S. A. K. W.

- [183] A case of acute transverse myelitis in a child (Un cas de myélite transverse aiguë chez l'enfant).—A. D. ESPINE. *Presse méd.*, 1920, xxviii, 617.

On the fifth day of an ill-defined illness characterized by pyrexia and a morbilliform rash, a boy, 8 years of age, developed a complete flaccid paralysis of both legs, together with a loss of sensation which extended as high as the umbilicus. There was also complete loss of control of both sphincters, and the weakened muscles showed the reaction of degeneration. The trunk above the umbilicus, the upper extremities, and the head were unaffected. The cerebrospinal fluid was normal. Considerable improvement eventually occurred. Urotropine was administered by the mouth and electricity applied daily to the paralyzed muscles. Landouzy describes the acute myelitis which follows measles as being characterized by its rarity, late appearance, short duration, and its tendency to be chiefly paraplegic in type. In the case under review, the child had attended hospital in infancy for a condition of slight diplegia. Accordingly, as is pointed out, the fresh infection was imposed on an already damaged nervous system, the resistance of which, it is assumed, was subnormal.

W. JOHNSON.

- [184] The resemblance of the sensory symptoms of post-diphtheritic ataxia to those seen in the cord changes of severe anæmia.—G. WILSON. *Arch. of Neurol. and Psychiat.*, 1919, ii, 201.

In three cases of post-diphtheritic ataxia in which the degree of motor paralysis was insignificant, the type of sensory loss resembled that seen in the combined sclerosis of pernicious or severe secondary anæmia. All three cases had paræsthesiæ in the hands and feet, and all showed a loss or marked impairment of the sense of position and of vibration; in two of the cases there was impairment of the ability to recognize the two points of a compass, although tactile sensibility was completely preserved. The pathological process was considered to be a toxic action on the posterior columns of the spinal cord. In this locality fibres conducting the osseous sense, the sense of position, and the ability to recognize the points of a compass are grouped together; had the peripheral nerves been diseased, it is probable that loss of deep pressure sense and marked impairment of motor power would have been found.

In discussing the sensory changes in the combined sclerosis of severe anæmia, the author credits Dejerine with having placed the peculiar clinical features upon a firm basis, no reference being made to the account by Russell, Batten, and Collier, whose description antedated that of Dejerine by three years.

R. M. S.

- [185] Visual and pupillary disturbances in cases of lesions of the lower spinal cord from gunshot wounds (Troubles visuels et pupillaires dans les lésions de la moelle dorso-lombaire et de la queue de cheval par traumatisme de guerre).—DEJERINE and RÉGARD. *Presse méd.*, 1920, xxviii, 673.

It has long been known that opticopupillary disturbances occasionally

occur in certain spinal diseases, among which may be mentioned acute myelitis, acute ascending meningomyelitis, Pott's disease, and trauma of the spinal cord. The authors give the details of three cases in which optic atrophy, especially on the temporal side, with diminution of visual acuity and also of the pupil reflex to light, was a sequel to gunshot wounds of the dorsal lumbar cord and cauda equina. They exclude as causative factors syphilis, retrobulbar neuritis, simultaneous double lesions of cord and cerebrum, augmentation in the pressure of the cerebrospinal fluid, and propagation to the meninges of the base of a spinal meningitis starting from the trauma, respectively, and come to the conclusion that the disorders are due to irritation of the vasomotor fibres of the iris and retina at their point of exit from the cord at the level of the second and third dorsal segments. In the same way as certain of the symptoms in paraplegia are due to irritation of the sympathetic fibres in the cord *below* the level of the lesion, so sympathetic symptoms may appear from irritation of sympathetic fibres *above* the level of the lesion.

S. A. K. W.

[186] Congenital paralysis of the brachial plexus.—A. S. TAYLOR.  
*Surg. Gynecol. and Obst.*, 1920, xxx.

THE author draws a parallel between obstetrical paralysis of the brachial plexus and the adult paralysis of Erb. He shows how, notwithstanding book-teaching, the obstetrical paralyses are not so easily curable as some authors would have them. Erb's paralysis is similar in etiology, anatomy, and symptomatology, except, of course, that the adult type cannot entail any arrest of development. His conclusions are that: (1) Medical treatment alone is insufficient except in those slight cases that usually get well without interference in two or three months; (2) Operation shows that in many cases the nerve-roots have been torn or that some scar tissue is present; and the pathological findings are against an exclusively medical treatment. His operative results in children under three months have been highly satisfactory, but in Erb's paralysis only about 30 per cent of his cases showed much improvement.

J. E. NICOLE.

[187] Spondylitis and abdominal pain.—D. VANDERHOOF. *Jour. Amer. Med. Assoc.*, 1920, lxxiv, 25.

THE author remarks on the extreme paucity of records of spondylitis in medical literature: yet he has met with 87 cases in the last seven years in his own practice, in 23 of which abdominal pain was complained of, with absolutely no sign of visceral disease of any sort. The symptoms are usually pain and muscle spasms in the back, with limitation of movement and gradually developing rigidity due to the ossification of cartilage; but the most interesting type is where the inflammation involves nerve-roots by direct pressure of exudation and new bone-formation. In such nerve-root involvement the character of the pain varies from a slight aching to the most agonizing paroxysms, and these referred symptoms may be prominent, while there is little complaint of stiffness or pain in the back. They



are unilateral or predominate on one side, and are increased by movement and diminished in the recumbent posture. In some cases the patient wakes up suddenly with pain, which may be attributed to relaxation of muscles acting as a splint against sudden movements in waking hours. This pain may simulate all sorts of visceral lesions, and often leads to operations for stone in the kidney, appendicitis, gall-stones, etc. The condition may also simulate the crises of tabes.

The author considers that the arthritis is due to absorption from focal infections of which typhoid fever, rheumatic fever, and gonorrhœa are the most common in young subjects; but in persons over forty years old, by far the commonest focus is in connection with the teeth.

R. G. GORDON.

[188] Paralysis of the abdominal muscles in poliomyelitis (Ueber Bauchmuskellähmungen bei Poliomyelitis).—W. MITTELSTAEDT. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lviii, 1.

BASING his remarks on four cases of paralysis of the abdominal muscles following poliomyelitis, Mittelstaedt discusses the subject of paralysis of these muscles in general. He cannot accept Duchenne's explanation of lordosis, according to which the pelvis is tilted instinctively in order to shift the centre of gravity forwards and to cause the weight of the body to be borne by the muscles of the buttock, for if this were correct the deformity should be present when the patient sits up and should disappear when he lies down. The explanation given by Strasburger receives strong confirmation from these cases. According to this writer the pelvis is held in position by three groups of muscles. The rectus abdominis and the gluteus maximus raise the anterior border of the pelvis, the first by a direct pull, the latter by lowering the posterior border. The antagonists of these muscles—the flexors of the hip-joint, especially the iliopsoas and the rectus femoris—lower the anterior border. If the recti abdominis are paralyzed, the flexors of the hip overcome the glutei, and the pelvis tilts forwards. This is followed by a compensatory lordosis which prevents the body from falling forwards. In sitting, the attachments of the flexors of the hip are approximated, the tilting is less, and the lordosis is diminished. The lordosis persists when the patient lies on his back, but can be made to disappear by relaxing the flexors of the hip, that is, by flexing the thighs. This interaction of the muscles attached to the pelvis can be shown in another way. If a patient with paralysis of the recti abdominis attempts to raise both legs when he is lying on his back, he is unable to do so, but the lordosis is increased. The iliopsoas muscles are not paralyzed, as might be thought, but their power is used in tilting the pelvis forwards. The patient, however, is able to raise either leg alone, because the pelvis is then fixed by the opposite gluteus maximus.

In one patient it was noticed that the lower thoracic aperture was narrowed with each inspiration. In a healthy person the lower thoracic aperture is widened on inspiration by the pressure of the subdiaphragmatic organs, whose descent is limited by the resistance offered by the abdominal muscles to displacement of the viscera below. When this resistance is



removed by opening the abdomen or by weakness of the abdominal muscles, the subdiaphragmatic organs descend easily and the thoracic outlet is diminished by the tug of the contracting diaphragm.

In the same case a remarkable phenomenon was observed, one that has not been described before. When the patient attempted to 'draw in' the stomach, a 'ring of contraction' formed just above the level of the umbilicus. The appearance presented, as shown in a photograph, is exactly that which might be produced by tying a cord tightly round the body at this level. This constriction is thought to correspond with a small portion of the transversus muscle which has remained healthy. Another result of partial paralysis of the oblique muscles is the formation of protrusions (pseudohernia) in the abdominal wall. When these are small, the edges, which are formed by healthy muscle, are often well defined, and a hernia is simulated closely.

The evidence in favour of the contention, once opposed by Oppenheim but now generally accepted, that the muscles of the anterior abdominal wall are innervated segmentally, is fully discussed. They are supplied from the 8th to the 12th dorsal segments inclusive. The localization for the recti is higher than that for the obliques, so that in a lesion of the lowest dorsal region of the cord the lower portion of the obliques may be paralyzed while the recti are unaffected.

In a table a summary is given of forty cases of abdominal palsies following poliomyelitis described by Continental writers. The literature in English was not available.

W. J. ADIE.

- [189] Contributions on dystrophia myotonica (myotonia atrophica) (Klinische, psychopathologische, und anatomische Beiträge zur Dystrophia myotonica).—L. FISCHER. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lviii, 254.

MANY cases of myotonia atrophica have been described during the last ten years, and almost all writers agree that it is a disease *sui generis*; but the question of its etiology, especially with reference to the connection between the muscular atrophy and disturbances of internal secretion, still remains unanswered.

While Curschmann, who investigated his cases pharmacologically, could find no evidence of vagotonia or sympathicotonia, Hauptmann found increased secretion of sweat, saliva, and tears, extraordinarily strong reactions to pilocarpine, lymphocytosis, and eosinophilia, all of which, for him, are signs of disturbance in the autonomic system.

Another important symptom referable to disorders of the internal secretions is cataract. Fleischer has made a special study of its clinical features, and finds that it begins in middle life, affects both eyes, and ripens quickly. It begins in the cortex, with opacity of the posterior pole, from which star-shaped processes radiate. At the same time punctiform opacities appear in other layers of the lens. It differs materially from the cataract of tetany, which usually shows a large hard nucleus and begins as a supra-nuclear lamellar cataract, and also from cataract observed after extirpation

of the thyroid, where the opacity begins at the equator and spreads towards the poles in a manner exactly the reverse of the myotonic form. Fischer doubts the specificity of the changes described above as characteristic of the cataract of tetany. He points out that they differ from those of the senile form which is held to be a result of latent tetany, and considers that Fleischer's observations cannot be accepted as against the evidence conjecture that myotonia atrophica is an expression of hypoparathyroidism.

Both Hauptmann and Fleischer look upon myotonia atrophica as a heredo-familial degenerative disease. Hauptmann holds that it is not an independent disease, but is merely a combination of factors within the great group of heredo-familial diseases. Another combination might appear as another disease—e.g., hereditary ataxy—but all these diseases are connected and are attributable to a common fundamental defect. Fleischer made exact genealogical inquiries in 38 cases, and found evidence of heredity in 28. He considers that the disease may remain latent for five or six generations and then appear suddenly in several members of a family. In the preceding generations, and often in those that follow, presenile cataract is common. Cataract, therefore, is the first sign of a progressive process which leads ultimately to myotonia atrophica. Hauptmann refuses to place cataract in this prominent position. His view is that the dystrophy is transmitted in a latent form, following Mendelian laws, while the cataract is apparent. The author of this paper remarks that we are justified in describing myotonia atrophica as an independent disease so long as Thomsen's disease, Erb's dystrophy, the different forms of hereditary ataxy, etc., are accepted as being *sui generis*, and refers the reader to Curschmann's papers for the strict proof that the distribution of the amyotrophy, myotonia, and the trophic and secretory disturbances in this disease are peculiar to it and occur in no other hereditary degeneration.

Of the many hypotheses concerning the cause of the disease, none is entirely satisfactory. No one believes now that it is purely of myogenic origin, and recent workers conclude that the myotonia is of central origin. Naegeli's view that the primary defect is a disturbance of internal secretion has not been accepted, because it has not yet been proved that atrophy of muscles can be caused in this way. Hauptmann holds that a defective anlage both for the endocrine glands and the trophic centres of the muscles is the underlying factor. Fischer's view is that the internal secretory and dystrophic phenomena have a common cause which must be sought in the central nervous system, but is forced to admit that this has not yet received any anatomical support. He suggests that the changes may be chemical, or of a kind which cannot be demonstrated by methods in use at present.

The paper contains a report of a case examined after death. There were no changes in the ductless glands or in the nervous system.

W. J. ADIE.

## TREATMENT.

[190] The rôle of deep alcohol injections in the treatment of trigeminal neuralgia. HARVEY CRUSH. *Jour. Amer. Med. Assoc.*, 1920, lxxv, 441.

AFTER tracing the history of the practice of injecting peripheral nerves with alcohol for the relief of pain, the author points out its limitations and dangers. It is a temporary measure which has to be repeated at more and more frequent intervals, and in the hands of the less expert practitioners may result, as far as the fifth nerve is concerned, in such accidents as fibrosis of the pterygoid muscle with subsequent lock-jaw, paralysis of muscles of the eye or of the jaw, and even sloughing of the nasal bones. A great danger is the accidental injection of alcohol into the middle ear via the Eustachian tube, with resultant distressing labyrinthine involvement. In spite of these dangers, careful deep injection with alcohol would seem to be the best treatment for minor neuralgias, though nine months' relief is all that can be looked for. Patrick states that successful results average 30 per cent, partially successful 43 per cent, and failures 26 per cent. The author strongly deprecates the attempt to inject the Gasserian ganglion itself, for this is surrounded by an arachnoid space continuous with the posterior fossa, and the danger of injecting this with a tissue fixative is obvious. The procedure of choice in severe neuralgias is the complete Gasserian operation with avulsion of the sensory root. His conclusions are:—

1. Deep extracranial injections of alcohol into the maxillary and mandibular nerve-trunks near their foramina of exit from the skull have completely superseded peripheral neurectomies.

2. In neuralgias limited to one of the two lower divisions, which may possibly not extend into the other trigeminal areas, alcohol injections represent unquestionably the treatment of choice.

3. When the neuralgia has spread beyond its original area and come to involve that supplied by the adjacent division, a trigeminal neurectomy must be contemplated: but if no preceding deep injection has been given, it may be useful not only in insuring the type of the neuralgia but in giving the patient some warning as to what the numbness resulting from the neurectomy may amount to.

4. Injections are sometimes useful, furthermore, in determining in doubtful cases whether the syndrome is a true neuralgia of the *tic-douloureux* type, or one of the peculiar and rare pseudoneuralgias not amenable to relief either by injections or neurectomies.

5. Even the extracranial injections are not entirely free from risk, and in no case should they be purposely pushed to the point of attempting an injection of the Gasserian sheath itself.

6. With such perfect and permanent results as may be secured to-day by a trigeminal sensory-root avulsion, the prolonged and repeated use of injections in refractory cases which involve more than one division should be deplored.

R. G. GORDON.

- [191] On the influence of different forms of antisyphilitic treatment on the development of parasyphilitic diseases (Ueber den Einfluss der verschiedenen Formen antisyphilitischer Behandlung auf das Entstehen der metaluetischen Erkrankungen).—PETTE, *Deut. Zeits. f. Nervenhe.*, 1920, lxxii, 151.

TREATMENT by salvarsan and its variants has now perhaps been in progress a sufficient number of years to justify an examination of the question whether it has had any influence in preventing development of so-called metasyphilitic or parasyphilitic forms of nervous disease. The author has had the opportunity of investigating the clinical material of Professor Nonne, of Hamburg, during the last ten years, amounting for the purposes of his paper to something like 1300 cases. Among his more important conclusions are the following:—

1. The great majority of cases of tabes and of general paralysis are recruited from cases of syphilis which have never been treated at all. Thus, no fewer than 65 per cent of his tabetics had been cases of untreated syphilis, and 68 per cent of his general paralytics. On the other hand, the cases that had been properly treated were not more than 4 per cent and 1 per cent respectively.

2. The earlier the period at which syphilis is contracted, the longer is the incubation for parasyphilis. Thus this diminishes as the age period advances. The limits of incubation in his list of cases were 41 years and  $3\frac{1}{2}$  years.

3. The influence of mercurial treatment in shortening the incubation period is only apparent, for the appearance of parasyphilis in these mercurial-treated cases of syphilis is due chiefly to the virulence of the spirochæte.

4. The number of really satisfactorily treated mercurial cases is so small that it is unnecessary to incriminate mercury as a cause of the subsequent development of parasyphilis.

5. How far salvarsan and other arsenical preparations have been material in preventing the appearance of parasyphilis, it is extremely difficult to gauge. The author's general feeling is that salvarsan treatment shortens the incubation period. He is of the opinion that where he has seen tabes and general paralysis develop notwithstanding arsenical treatment for the syphilis, this latter treatment has never been sufficient according to the most modern standards, and he concludes that no case of parasyphilis has yet come under his observation in which the arsenical treatment for the syphilis had been adequate.

S. A. K. W.

## Psychopathology.

### PSYCHONEUROSES AND PSYCHOSES.

[192] Anxiety states occurring at the involutional period. D. K. HENDERSON. *Jour. of Ment. Sci.*, 1920, lxvi, 274.

THE writer gives a sketch of a typical case showing the symptoms of restlessness, depression, suicidal tendency, self-accusations, and apprehension of injury from others, with orientation and personality well retained, and asks how such a case is to be interpreted. It must be approached from the point of view of breaking with lifelong adjustments and inability to form new adjustments, with a resulting depression. The complex material expressed may bear a close relationship to the anxiety. Statistics given tend to prove that anxiety states occurring at the involutional period are relatively frequent, and that anxiety is a benign type of reaction. It is argued that at the involutional period the body chemistry undergoes marked changes, especially in the sexual sphere, so that adaptations to fresh stressful situations in life becomes difficult, and anxiety may result in those with unstable nervous systems. The past occupies the mind disproportionately, and former worries become overwhelming; the prickings of conscience loom in the foreground, and repressed thoughts often find expression in crude sexual beliefs and ideas. A conflict of instincts brings about the anxiety, fear, and apprehension, with insomnia, delusions, and not uncommonly attempts at suicide. Great care should be used in confounding such cases with arteriosclerotic brain disease, which should be limited to those with a history of headache, vertigo, convulsive attacks, and a defective memory.

From the point of view of etiology, it is striking to find how frequently in anxiety states, mental factors such as the death of a near relative, financial and business worries, the breaking up of a home, etc., are assigned as the existing cause. It is said that the percentage of involutional cases is much greater in rural districts—perhaps from the narrower mental horizon there. Anxiety states and manic-depressive types may be somewhat distinguished symptomatically, in that fear and apprehension with somato-psychic delusions tend to dominate the position in the former, while in the latter the depression is much more of the slow, retarded variety with a subjective feeling of difficulty in thinking. Anxiety states run a more acute course, the danger of death is greater, but on the whole the prognosis is better than in manic-depressive, though in both recurrence is common. We are, then, more or less forced to recognize the prevalence of a group of cases which may be called the anxiety reaction type. The relation of this to Freud's anxiety neurosis is spoken of, and the clinical picture is pointed out to be much the same, but conduct is less under control in the psychosis, which seems to act as a safety-valve and allows the patient to give expression to those doubts and fears which in normal life he had so carefully repressed. Such cases should be thought of from a broad biological standpoint. Their real difficulties should be fathomed if possible, and assisted, and we must recognize that symptoms of fear and anxiety



are unhealthy methods of meeting instinctive difficulties. The whole life history of the patient should be discussed.

C. STANFORD READ.

[193] **Psychology and schizophrenia.**—EDWARD W. LAZELL. *Psycho-analytic Rev.*, 1920, vii, 224.

ANALYSES of patients who broke from 'stress of war' lead to the discovery of basic causes in conditions antedating induction into the service. The stress of service as the exciting cause is only intelligible when viewed as *a new internal conflict*. The constitutional make-up of the individual is an important factor. The subject of death is psychologically dwelt upon in connection with war, and it is stated that though we have the concept of the death of others we have no concept of our own, and all fear is reducible to the fear of death, which is always our own death. Those who broke down in war encountered an intense emotional resistance which prevented the onward flow of the libido, and it, being fixed at a lower level, especially the mother level, came to the surface in its infantile combinations. The writer is convinced that in schizophrenia the early symptoms were those of anxiety neurosis, and also that a sexual element is the basic factor. Briefly, the relation of infantile affects such as love and hate, and their relation to the concept of death, is spoken of, and the ideas of Freud on the psychic mechanisms of primitive man with reference to death, killing, sacrifice, remorse, and the development of the taboo, etc., are summarized. Much evidence resulting from the study of schizophrenia shows that the fear of death is an elaboration of the sexual instinct; but we must remember that the sexual element is largely symbolized; also that the fear of death is an ambivalent emotion. The hebephrenic may wish to die, as symbolized by his return to the mother, but it is for the purpose of rebirth; the catatonic submits to the authority of the father, who is the personification of the incest wish; the paranoid symbolizes his father hatred, projects it on to the world, and redirects it towards himself in the delusions of persecution. Back of all these is the fear of death, which resolves itself into the fear of the loss of the mother and the revenge of the father.

When a man cannot renounce his egotistical ideas of self-preservation and the lower loves on which this is based, and society and his own self-respect demand this renunciation, the onward flow of the libido is blocked, and he regresses to some stage of his infantile existence. This is the *first flight*. This is a symbolic death of the libido, of the personality which solves his difficulties concerning the fear of being killed, and also social responsibility, but embroils him in infantile mental conflicts which are intolerable. Two courses are then open: (1) Shutting out conscious activity regarding sexual ideas, dwelling on them only in phantasy, the hebephrenic solution; or (2) Returning to the normal level without insight, forgetting the whole experience. Complete regression, as in the hebephrenic, or satisfactory symbolization of his subconscious to the father image in the paranoid type, involves a cessation of rebellion against the sexual infantile ideas, and constitutes the *second flight*, in which the patient

is comfortable but will not recover while in such a state. All cases of schizophrenia breaking down from the strain of war recover, unless a new obstacle is encountered. If by adjusting to reality the patient finds himself in a third intolerable situation, he does not recover.

Some pages are then devoted to a discussion on infantile sexual trends and their distorted reappearance in schizophrenia symptoms. Doubt is expressed that regression to the intra-uterine level ever occurs in this disorder, and also that suicide means a return to the maternal matrix. The fact that such patients so often hang themselves under difficult conditions, or cut their throats, suggests the expiation of their crime at the symbolic level, a modified crucifixion, and rather a submission to the father. The oppressive sense of guilt has inverted the fear of death into the fear of life.

C. STANFORD READ.

[194] The hereditary burden of dipsomaniacs (Die hereditäre Belastung der Dipsomanen).—DOBNIGG and C. v. ECONOMO. *Allg. Zeits. f. Psychiat.*, 1920, lxxvi, 383.

PROFESSOR ECONOMO published, in 1914, observations on the hereditary element in paranoia, querulans, and Dr. Dobnigg and he commenced a similar investigation of the fifty cases of dipsomania treated at the Vienna clinic during the preceding twenty years. The patients were personally examined and their relatives interviewed, but this had been carried out for only twenty-three cases. The present altered conditions in Vienna preclude the resumption of this investigation, so that these pre-war data are now published. What constitutes dipsomania is still a moot point. In the present discussion, the individual who drinks when occasion offers and the chronic alcoholic who exceeds himself at times are both excluded. There remain individuals who, abstinent or very moderate as a rule, from time to time give way to excessive drinking, which is not adequately conditioned by external circumstance, but rather determined by inner pathological motives. There are those who on trivial vexation try to drown their feelings by drinking heavily; others who are spontaneously driven from time to time to resort to alcohol. It is these two latter groups that are designated 'dipsomania'.

The analysis of the family histories of the twenty-three cases above mentioned bore out the general impression that dipsomaniacs are psychopaths, and showed that they could be grouped under three headings. About a third had relatives subject to epilepsy, another third had the predisposition to manic-depressive insanity, whilst the remainder could not be further defined, only general signs of degeneracy being present. Since the depression lifted after the sleep following the debauch, it could not be regarded as a true melancholic attack; similarly the dipsomania was not a true epileptic equivalent. Dipsomania is not a disease entity, but a symptom complex occurring in psychopathic individuals whose relatives are usually themselves heavy drinkers.

H. W. HILLS.

- [195] Two instances of familial dementia præcox (Deux cas de démence précoce familiale).—LAIGNEL-LAVASTINE. *L'Encéphale*, 1920, xv, 361.

EXAMPLES of dementia præcox occurring in different members of the same family are not uncommon. In the first instance given, brother and sister were affected. The family history was bad: the father was alcoholic and paranoid, and was stated to have had syphilis. All the paternal relatives were nervous and unstable. A nephew was an idiot.

There were five children in the family, of whom the first two died in infancy of meningal trouble: the eldest surviving child was normal. The male patient was nervous and fretful when quite young, and the symptoms of dementia præcox appeared when he was seventeen and a half, after an injury to the head. He was suspicious, restless, destructive, and influenced by ideas of persecution. For several months he exhibited mutism, and became increasingly apathetic.

The sister was apparently normal as a child, but mental symptoms developed at twelve after a fright. There was a remission. She had chorea at fifteen, and about seventeen she showed definite signs of mental disorder. She had paranoid ideas, was apprehensive, capricious in regard to food, and apathetic, usually mute, and there were grimaces and mannerisms.

Both are now mentally enfeebled, disoriented, and apathetic, make grimaces, and show a tendency to remain in one posture. The youth exhibits more mutism, inertia and catatonia, echolalia and stereotypy. The girl is more excited: laughs, talks incoherently, is childish and timid, and speaks in the third person.

In the second series of cases there was paranoid dementia præcox in three sisters. The first exhibited mutism, stereotypy, explosive laughter, and apathy. She had pulmonary tuberculosis. For a time there was a remission of symptoms. She then again exhibited emotional instability, and was influenced by ideas of persecution. She had to be tube-fed, and was resistive and suicidal. The second sister had ideas of persecution and of grandeur, and was influenced by auditory hallucinations. She also had phthisis. The third sister was paranoid and hypochondriacal. There was a strongly neuropathic family history.

Where one member of a family is found to be suffering from definite dementia præcox, material assistance may be derived in forming a diagnosis when the patient's brothers or sisters begin to develop mental disorder.

HUBERT J. NORMAN.

- [196] Echo of reading in the insane (L'écho de la lecture).—LAIGNEL-LAVASTINE and VINCHON. *L'Encéphale*, 1920, xv, 496.

SUFFERERS from delusional insanity of the hallucinatory type read little, and always the same book—for example, a breviary. In some the delusional scheme occupies their whole attention: others find in long reveries the best escape from their misery: while some refrain from reading because their thoughts are 'stolen' or 'echoed'.

Cases are quoted in illustration of this. In one it seems as if, whenever the patient attempts to read, something of a quite contrary meaning

obtrudes itself on the text and prevents her from continuing. She is not sure whether she sees it printed or if she hears it. The second hears whisperings as soon as she commences—a sort of whistling, with hardly perceptible words. When she says prayers that are familiar to her the voices repeat them. The third thinks that at times when she is reading it is really someone else who is doing it; and that she is made to see phrases with a contrary meaning. The fourth has ceased to read; for a time she persisted in spite of a murmuring which had no relation to the text. The echo was either simultaneous with the reading or during the period of reflection afterwards.

In each of the four cases there is a common factor—moral and physical pain—which accompanies the hallucinations, and the memory of which is distressing. The echo is usually simultaneous with the reading; more rarely during the period of reflection. As a rule it is a vague, unintelligible whispering, with, perhaps, a few words related to the delusional condition, thus convincing the patient of their objective origin.

It is possible that at an early stage of our evolution there was definite and distinct visual and auditory language. In time, however, cohesion and blending followed, so that ideograms resulted, of which it would be difficult to say whether they are visual or auditory. As in an orchestra the separate instruments are not distinguished, so with language it is the general effect which is noticed. According to Bergson the act of reading is made up of the perception of the words, the association of ideas with these words, and finally the identification of the ideas by relating them to former similar ideas. The feeling of effort is produced at the moment when the ideas suggested by the printed words are realized in concrete images capable of recalling the words, the sense of which will then become clear. If, however, as a result of the feelings of discomfort, this last operation escapes the control of the patient so that it seems strange and unfamiliar, the echo will be invoked by him as an explanation of the pathological phenomenon. The degree of this will vary with the patient's condition; but if it is marked he will cease to read because the effort aggravates his disquiet and increases the hallucinations. Another hypothesis is that the echo is nothing more than a tentative hallucination which does not actually come into being.

The mechanism involved in the 'echo of reading' shows the pathological transformation of a normal intellectual process. Here, as in so many instances, the chief factor lies in the primary disorder of sensibility, always little understood, which is the price paid by the higher organisms for their evolutionary ascent.

HUBERT J. NORMAN.

[197] *Dementia præcox in twins* (Démence précoce gémellaire).—  
LAIGNEL-LAVASTINE and BOUTET. *L'Encéphale*, 1920, xv, 267.

THE patients (twin sisters) were originally admitted to an asylum in 1913 with a diagnosis of 'folie à deux'. One of them, who was looked upon as the active factor, remained in institutional care until her death in February,



1920. The other sister was discharged after three months in the asylum, and was not readmitted until November, 1919.

The sisters were 37 years of age and of Jewish origin; and for about a year prior to admission G., the dominant one, had been depressed, and her physical condition had failed. On admission, she was in feeble health, and was influenced by auditory hallucinations and by persecutory ideas. Orientation and memory were practically unaffected, as were attention, association of ideas, judgement, and moral sense. Affectivity and the power of voluntary movement showed the chief impairment. She was extremely apathetic, and careless about her dress and personal appearance. She smiled or laughed for no apparent reason. Death eventually ensued from pneumonia.

The sister, B., was, on admission, diagnosed as exhibiting mental reduction with ideas of persecution. She, too, was in poor physical condition; and was depressed, suicidal, and deluded. She improved sufficiently to be discharged, and was able to earn a livelihood—even to help her sister—for several years. During this time, however, she was not really well, but was suspicious, preoccupied, and strange in her manner. In the autumn of 1919 she became steadily worse. She remained for days in bed, and would have died of inanition had she been left alone. When admitted to the asylum in November, 1919, she was in a pitiable state, emaciated and uncared for, and had a tuberculous focus in the right apex. Influenced by auditory hallucinations, she grimaced, exhibited mannerisms, and was resistive. In the course of time the symptoms became even more significant; she was taciturn, sluggish, and indifferent, and negativism became more marked. Although the patient appeared to be demented, the enfeeblement was more apparent than real; and by means of careful questioning it was found that she still retained much intellectual ability: memory was little impaired, while attention, though difficult to arouse or to sustain, was preserved.

HUBERT J. NORMAN.

[198] (1) The case of Jack; (2) The case of Jim.—DUDLEY WARD FAY. *Psycho-analytic Rev.*, 1920, vii, 333.

THESE articles constitute a superficial analysis of two psychotic cases which are of interest, since it is plainly shown how psycho-analytic knowledge may help a psychiatrist to lead such patients towards recovery. The first case is of a præcox type, and the second seemingly an anxiety psychosis. They may be summarized as follows:—

1. An over-conscientious, sensitive boy worries at puberty over his inability to resist masturbation; thinks it is a sign of weak-mindedness, that other people can see it in his face that he practises it, and so look down on him, with the result that he day-dreams and becomes asocial. He thus does poorly at work and at school. He falls in love in adolescence, but his sense of inferiority causes him to withdraw in the face of a rival. He contracts gonorrhœa, considers himself hopelessly disgraced and without the right to marry any girl. He worries and worries. In the Navy the fear of death from submarines aggravates his condition. Finally, he



believes people think him a passive homosexual pervert, and he is sent to hospital labelled dementia praecox. He is there retarded, negativistic, remorseful, and worrying over his sins. After much difficulty he is induced to confess them. These are belittled, and hope is held out for the future. Gradually he emerges from the psychosis and becomes free from delusions and hallucinations. Through psycho-analytic aid he gets full insight into his condition, and understands the endogenous origin of his former delusions. He calls his recovery a rebirth, and regards it as a blessing in disguise, since through the analysis he has got rid of morbid remorse, has learnt to recognize and face his difficulties, and can start life afresh with courage and self-respect.

2. A sexually precocious boy, extremely fond of his mother, makes incestuous attempts on her and his little sister. The sister incest haunts his life with bitter remorse. In adolescence he is bashful, retiring, and lazy, much given to dreaming of easy money and sex phantasies. On board ship in the Navy a psychosis develops. To his remorse is added the idea of fellatio. While his ship is abroad a sailor's family take him to their home, and he falls in love with the daughter, but feels utterly unworthy and tries to kill himself. In hospital he dramatizes his conflict as a contest between God and the devil, each trying to win him: he is sure the devil has got control of him for ever, and that he is doomed to eternal punishment. His sex power is gone. With psycho-analytic aid he makes a rapid recovery, his potency returns, he goes home, and is now living a happy and robust life.

C. STANFORD READ.

[199] A clinical study of some mental contents in epileptic attacks.

—L. Pierce Clark. *Psycho-analytic Rev.*, 1920, vii, 366.

SUCH studies of the transitory deliria give a better understanding of the epileptic make-up and the manner in which the epileptic mishandles his emotional reactions to his environment. An insight is also thus gained as to the therapeutic and educational training towards a more stable mental health. With the aid of the newer psychological interpretations the vague, disjointed, cryptic remarks made by epileptic deliriantes may be translated. The main purpose of these studies\* is to help solve psychologically the real nature and defect of the epileptic *as an individual*, and to find the psychological conflicts which aid in bringing on the attack: secondly, thus possibly to arrive at a more rational method of treating the individual case. The study and use of spontaneous unconscious productions ought to help the epileptic towards better mental health, and aid him in mastering his defects and his disease, which are really one and the same thing. When no twilight or automatic states are presented, research is more difficult, as conscious rationalization and resistances hindering analysis have to be overcome. The epileptic is so egoistic and

\* For previous studies see: (1) "Psychological and Therapeutic Value of Studying Mental Content during the following Epileptic Attacks", *N.Y. Med. Jour.*, 1917, Oct. 13; (2) "A Further Study of Mental Content in Epilepsy", *Psychiatric Bulletin*, 1918, Oct.

sensitive by nature that the conscious method is tedious and slow. The epileptic's unconscious strivings prove him an egoist with a lust for domination, one whose mental strivings are crude and archaic and with a great emotional poverty. With such a defective mental endowment it is patent why recovery in epileptics is infrequent. To do any permanent good to the epileptic, reconstruction must be undertaken at the earliest date possible after the nature of the disease is recognized.

A brief and superficial analysis is then given of various fragments of the mental content in the temporary deliria of some epileptics. Clark thinks it possible that the spontaneous productions in all deliriant (drug, fever, and psychogenic), when finally analyzed and freed from symbolisms, may not be causative of the disorder itself, but that all these states are the freeing forces loosening conscious inhibitions and allowing these direct emanations from the unconscious to appear. In epilepsy there is such an inferiority of the sexual instinct that we may not analyze it out, but give the patients an acceptable sublimation and educational training to help them to a life of effort and pleasure compatible with the inherent defect of instincts which they possess. The studies in mental content give us a more precise recognition of the individual's type of defect and what specific points of attack we may adopt. Those who present no mental content and no transitory deliria must be handled by conscious analysis of their life's reactions. The occurrence of deliria in any epileptic makes for a relatively poor prognosis in that individual.

C. STANFORD READ.

[200] Out-patient psychiatry.—ABRAHAM MYERSON. *Amer. Jour. Insan.*, 1920, lxxvii, 47.

THIS is an interesting report on the out-patient work of the psychopathic department of the Boston State Hospital. Statistical tables are given and briefly commented on. In discussing the diagnoses made, the author says much of value. Among special types of psychoneuroses, he draws attention to the 'neurosis of the housewife', resulting from monotony, poverty, loss of beauty, child-bearing, and conjugal difficulties; cases under the heading of 'pathology of conscience', where the symptoms can be traced partly at least to an over-conscientious attitude of the patient towards himself; and a group of hysterics in which the symptoms seem directly referable to the reaction of the individual towards the disagreeable things in his or her life. It is pointed out that feeble-mindedness is not a unitary condition, and according to its pathology may be a medical or social problem. It is believed that the importance of heredity in producing this condition has been greatly over-estimated, in that the large number of individuals who become feeble-minded arise in otherwise normal families. On the question of delinquency a wide viewpoint is adopted.

In conclusion, Myerson makes some particularly rational observations on the out-patient view of psychiatry. He points out that the term insanity is essentially a legal conception, and has hampered the psychiatrist, who from the out-patient point of view deals with mental disease and includes in this category on an even basis the so-called psychoses and the so-called

psychoneuroses. Cases of dementia præcox, manic-depressive insanity, and involutional melancholia are met with where such patients are not insane or committable though mental disease is present. Insanity and committability are legal and therapeutic matters and not diagnostic. The term 'neurosis' is regarded as a pure euphemism, for most cases of psychasthenia and hysteria are entirely mental, and as truly psychotic as dementia præcox, and much more so than general paresis. In these latter diseases the *majority* of cases is legally insane and committable; in the psychoneuroses only a *minority* needs commitment. In any case before us the problem present would be, What type of disease is being dealt with? and second, Does this patient need commitment, or can he be cared for in the community? The terms insanity and psychosis with their obscurities would never need to occur in a *medical* discussion.

C. STANFORD READ.

- [201] The relationship between the original character and a subsequently developing psychosis (Caractère individuel et aliénation mentale).—W. BOVEN. *Schweiz. Arch. f. Neurol. u. Psychiat.*, 1920, vi, 317.

The author sets himself the task of determining whether each psychosis develops in a particular predisposed mental terrain, just as every plant grows in a special habitat suitable to itself. With this end in view he has studied in great detail the early (primitive) character of thirty precocious demented and twenty manic-depressives, all advanced and typical cases. The early histories of these cases were obtained from their parents, relations, friends, and neighbours. By this means Boven not only received information as to the early character of each of his patients, but was able to form an opinion as to the environment to which it had been subjected. As a result he is enabled to draw up a table showing the primitive character traits which differentiate those who subsequently developed dementia præcox from those who developed manic-depressive insanity. There is thus marked out a sort of 'characterologic topography' in which the two psychoses demarcate spontaneously a certain domain, or 'character complex', as appropriate to each respectively, though its frontiers are by no means hard-and-fast. No single trait is pathognomonic, and the 'character complex' must be viewed as a whole. The author proceeds to consider whether the primitive character conditions not only the 'choice' of psychosis, but also its form and variety, and even the type of delusion developed. Yet Boven does not consider the primitive character to be the only factor conditioning the manifestations of a psychosis. He seeks to harmonize the apparently irreconcilable views of Tilling and Neisser. To explain his attitude he uses the illustration of drunkenness. The character of a drunkard does not entirely, though it does very largely, condition the symptoms which he manifests in drink; yet alcohol is an indispensable factor in the outbreak of this short madness.

Finally the following conclusions are reached: Every psychosis is at the same time psychic and organic. These are but two aspects of the same *ensemble* of phenomena, and to attempt to attribute the origin of a

psychosis exclusively to the one or the other is misleading. A toxic factor may be suspected without thereby denying the importance of the rôle played by the primitive character in determining the clinical picture of a psychosis. The two factors, far from being mutually exclusive, are truly complementary to one another. A psychosis (dementia præcox for example) may be considered as the reaction of a psychic personality to the action of an organic agent, which latter may be outside the confines of the nervous system. Character gives the individual formula to the somatopsychic equilibrium. It discloses weak spots long before the outbreak of a psychosis, and thus gives warning as to the form which a breakdown of the equilibrium will take. For this reason a knowledge of the primitive character of the insane is a matter not only of interest but of importance.

ALFRED CARVER.

[202] Some mechanisms of paraphrenia. MARY K. ISHAM. *Amer. Jour. Insan.*, 1920, lxxvii, 91.

THE writer reviews her subject from a purely psycho-analytic standpoint. The psychological mechanisms involved in paranoia and paraphrenia are compared, since they have much in common. The paraphrenic has not been able to pass comfortably through the stage from self to object love, and so later in the face of conflict he regresses to an auto-erotic stage where a satisfying adjustment was first made. Narcissism is never carried through with sufficient integrity to keep from bothering the paraphrenic in adult years. The individual is early checked from without, and for ever seeks to remedy his deficiency, real or phantased. Besides the blocking in self which arises from disparaging remarks, another source is found in the predisposition to identification. The child identifies itself with a pitiable object from which it shrinks, and so creates a constant conflict with both opposing forces in the unconscious. As it cannot find pleasure in itself as a whole, it seeks this in separate erogenous zones, or even goes back to an animistic level. If in the early stages of exhibitionism there is a painful idea of his own appearance, the individual as a recompense will seek a less acute contact with reality if predisposed to repression. Later this impression of physical inferiority may be seized upon as a defence in time of conflicts impossible of ordinary methods of resolution. The environment continually acting upon the patient must be taken into account as well as the latter's predispositions. On these lines a case showing paraphrenic mechanisms complicated with those of paranoia is discussed. The value of this, however, seems somewhat mitigated by the writer stating in conclusion that though this illustrative patient belongs more toward the præcox end than the paranoiac, there may be some question as to whether she did not belong to a depressed type of manic-depressive insanity, or whether it was not a case of compulsion neurosis run into a delusional form.

C. STANFORD READ.



## PSYCHOLOGY AND PSYCHOPATHOLOGY.

[203] Freud's concept of the 'censorship'.--W. H. R. RIVERS.  
*Psycho-analytic Rev.*, 1920, vii, 213.

THERE are many who, though following Freud largely in his psychology, find it difficult to accept the concept of an agency so wholly in the pattern of the conscious but working within the unconscious as is the case with Freud's censorship. The author thinks that the clue to the nature of such a process should be sought rather in the realms of physiology than sociology. He would assume that there is an organization of unconscious experience in which there are a number of levels in which adult experience would be higher in position than that of the youth, and this again would be above the experience of childhood and infancy. Each level more recently acquired would control an earlier one. Such an organization would be similar to the functional levels of the nervous system. Each level would not only have its own particular material, but also its own characteristic methods of feeling, thinking, and acting. The character of the dream could then be sufficiently explained by the removal of higher controlling levels in sleep, so that lower levels with their infantile mode of expression can manifest themselves in their natural guise. The latent content is not distorted through any censor, but because the form in which this content manifests itself depends on something inherent in the experience which forms the latent content or inherent in the mode of activity by which it is expressed. Without the control of later experience the dream experience must take the form proper to it. Nevertheless, Freud's conception that the dream has a protective and defensive function may be a factor which has assisted the survival of the dream as a feature of mental activity; but this has been unduly emphasized.

Slips of the tongue or pen may also be thus more satisfactorily explained than by any censor, by presuming that earlier phases of thought ordinarily held in check by later developments gain sway through fatigue or some such factor causing temporary failure of inhibition. The concept of a guardian watching at the threshold of consciousness does seem to apply well to the repression of the unpleasant: but as the censorship only explains some facts, it is probably only a secondary process, a later addition to one which has a more deeply-seated origin.

Hysterical disability is amply explained by a process in which the higher levels are put in abeyance, so that the lower levels find mimetic and symbolic expression as a refuge from conflict, just as the savage is content with a mimetic representation of some wish which fulfils for him all the purposes of reality. It is pointed out that the hysterical abrogation of control is closely connected with suggestion, which process is seen from the study of savage peoples and animals to be primitive, so that hysteria may be regarded as the coming into activity of an early form of reaction to a dangerous or difficult situation. Freud's censorship is therefore an artificial and unnecessary conception in hysteria.

In the sphere of motor activity as seen in false strokes in work or play, Rivers sees failures of adjustment due either to weakening of control



or disturbances in the controlled tendencies to movement. Though these are manifestations of nervous functioning similar to those which Freud explains by his concept of the censorship, it would be very difficult, if not impossible, to trace its activity in them. The same may be said of ties, where instinctive reactions gain the upper hand.

In conclusion, the author sees confirmation of his ideas in the study of human culture, and points out that every kind of human society reveals a hierarchical arrangement in which higher ranks control the lower, and inhibit or suppress activities belonging to earlier phases of culture. Here the process of censorship forms only a very small part of the total mass of inhibiting forces. In times of stress, control exerted by more recent developments of social activity is weakened and the earlier levels reveal themselves in symbolic forms.

C. STANFORD READ.

[204] A new theory of sleep and dreams.—EUGENIO RIGNANO. *Mind*, 1920, cxv, 313.

THE theory is here developed that sleep is a functional rest or suspension of the affective activity of the personality. Psychological activities may be divided into two fundamental categories, *affective* and *intellective*. The former, which includes activities of attention and volition, is incessantly in action. That is to say, certain fundamental interests, professional pursuits, and the like, determine the daily reactions of the individual and are in functional activity from morning to night. There is, moreover, another secondary affectivity, which is the desire of not deceiving one's self, the fear of not acting in the most appropriate way, and the anxiety to behave in the most becoming manner. This serves to hold in check and control the fundamental affective activity which continually urges to action. During the day, then, gradual exhaustion of the affective potential energy takes place. It is otherwise with the *intellective* activities, by which is understood the simple evocation of sensorial and mnemonic-sensorial elements. Though numerous images may be excited during the day, they are very varied, and none of them last long enough or repeat themselves with enough insistence to exhaust the energy of their respective nervous centres. It is thus the exhausted affectivity which ceases to be active during sleep, while the sensorial elements remain active in the form of dreams.

This theory is supported by reference to the psychological characteristics of dreams. The author finds these to be: (1) Non-affectivity; (2) Incoherence; (3) Illogicalism. He finds evidence of affective silence in dreams on the following grounds: Dreams are not related to significant daily interests, but to indifferent matters; the absence of emotions such as surprise and shame in respect of dream situations which in waking life would provoke strong reactions; and the purely physiological basis of anxiety-dream states. Given this non-affectivity, the other dream characteristics follow as a natural sequence. The failure of that evoking, directing, selective, and inhibitory action, which is the function of affective conative tendencies, produces an anarchical, planless activity of sensory reminiscences

which are readily forgotten, easily induced by indifferent stimuli, and subject to constant metamorphoses. The illogicalism is due to the suspension of the secondary affective tendency—the critical spirit. In waking life this is in opposition to our fundamental interests. It prevents us from making mistakes or acting stupidly: but in dream life the most ridiculous situations in which we find ourselves are accepted as a matter of course, without surprise or vexation. Thus dreams may be defined as “an ideative anarchy consequent on the cessation of all affective control”.

H. DEVINE.

[205] Instinct considered in the light of modern biology (Das Instinktproblem im Lichte der modernen Biologie).—RUDOLPH BRUN, *Schweiz. Arch. f. Neurol. u. Psychiat.*, 1920, vi, 80.

THE author undertakes a comprehensive review of the problems to which instinctive phenomena give rise. He defines instincts as inherited inborn organizations of the nervous system of a species through which a specific stimulus, arising either from within or without the organism, automatically and independently of any previous experience brings about appropriate reactions with ekphoria. This is reminiscent of Hering's aphorism, “Instinct is the inherited memory of the species”. Dynamically considered, the instincts are merely the functional aspect of the life interest (Horme) of the species. In lower organisms there is laid down, in the form of an hereditary structural mechanism, not only the general life-programme of the species, but also in greater or less degree the detailed reactions through which it may be realized. The author agrees with Loeb that owing to close relationship existing between function and structure, especially in insects, it is practically impossible to separate the instincts from the vegetative processes of growth and development. In the words of Reuter, “The body produces exactly the material with which the instinct works”.

As the evolutionary scale is ascended, inherited automatic mechanisms become increasingly inadequate to carry out the organism's life-interest, and higher cephalic functions are developed to assume control over the more primitive (Prinzip der Wandering der Function nach dem Frontalende). Thus the complicated instincts of high animals (especially man) are not ‘fixed’, but take the form of plastic inherited predispositions. The freedom of action which this would seem to imply is, however, only apparent, for the inherited disposition acting as an affective censor exercises a far-reaching control over experience. Instincts are classified, according to the life interest which they subserve, under one or other of two headings—self-preservation or preservation of the species. The ekphoria of the instincts normally is bound up with a complex energetic situation which embraces either interoceptive conditions—morphological and biochemical—or exteroceptive conditions—the appearance of a specific sense-excitation. Experience exercises a twofold influence upon instinctive processes. The first is exemplified by the ‘conditional reflexes’ of Pawlow. The second is due to the constant conflict of interests which conduces to plasticity of response, though it does not actually modify the instinct itself. As the subjective correlates of the primary instinctive impulses, certain (psychical)

feelings come into being—the *Urgefühle* of von Monakow. These are in themselves objectless, i.e., independent of external sensory experience: yet they orientate us in search after the actual external energetic situation. Normally the course of an instinctive action proceeds to its goal by phases, each of which is associated with a certain satisfaction. If during any phase the object of the instinct is withdrawn, the organism manifests dissatisfaction and seeks for the lost stimulus (*Sekundären Reizsuchung*). Should this search be unsuccessful, the instinct pursues a more or less abnormal course. Five such are distinguished. If two instincts with opposed interests come into conflict, there results, according to circumstances, either (*a*) complete repression of one or the other, usually the more primitive, or (*b*) a compromise between the two. The first possibility allows of successful sublimation, the latter gives rise to so-called hysterical symptoms. Pathological anomalies of the instinctive life (*Hormopathien*) are classified, according to their genesis, under the headings of primary (endogenous) and secondary (exogenous).

ALFRED CARVER.

[206] Trade unionism and temperament: notes on the psychiatric point of view in industry.—E. E. SOUTHARD. *Mental Hygiene*, 1920, iv, 281.

DR. SOUTHARD reviews the main factors in the production of the world-situation of to-day. Trade unionism is a movement without concrete philosophy, with an unfathomed history and an unpredictable future. 'Ology' and 'ism' interact and are interdependent. Marxian Socialism was based on the ideas of many philosophers—Hegel, Saint-Simon, Adam Smith and his followers—and in turn influenced the German schools of political economy and jurisprudence. Marx stood for self-help. Sismondi cried, "Is wealth everything? Are men nothing?" Statisticians built on the 'average man'; Ricardian economists on the 'economic man', making man a machine. British economists gave us the theory of prosperity on its tripod of wealth, wages, and profit. The great war, and the fulminating embarrassments of the present in the effort toward reconstruction, may have arisen from: (1) The bad morals and faulty education of the people or their leaders; or (2) A falsely evolving rural system with excessive accent, now on social control, now on individual liberty; or (3) A blind economic development. But in facing these problems the omission of theory, science, or philosophy would be a catastrophe. The complete history of Bolshevism cannot be written without a thorough account of the psychopathic personalities contributing to it, and, primarily, to the great war. The noble endeavours of Head, of Heart, and of the Long Arm in scientific management, social welfare, and social justice have been of little avail. Science, moralists, and lawyers have had their influence. To-day the individual categories of medicine, the art which of all arts has always taken the individual as its object, are called to serve in such complicated fields as that of trade unionism (which seems a phenomenon of mass psychology). Industrial psychiatry is already a subject of investigation by (*a*) psychologists, (*b*) psychiatrists, and (*c*) sociologists.

The pooling of psychiatry and economics has proved productive. Its application to trade unionism awaits us. Mass psychology is little understood: in it temperament has no positive value, and at present can only be described in terms of the individual. Yet from this standpoint there is much that is instructive: and on something of these analytic lines the psychiatrist may help to solve like problems. Hoxie spent ten years in the intensive study of trade unionism, and evolved a theory of four functional types: (1) Business-, (2) Uplift-, (3) Revolutionary-, and (4) Predatory-unionism. These respectively correspond to the four classical temperaments of Hippocrates and Galen: the phlegmatic, the sanguine, the melancholic, and the choleric. These 'humours' were described with rare insight and emphasis, which is approximately confirmed by the endocrine researches of to-day.

1. *Business unionism* is a logical machine, avoids extremes, accepts the existent wage system, and seeks, by mutual support and occasional strikes, the best terms for its members. Its purview is narrow, being confined to the craft or trade.

2. *Uplift unionism* accepts not only the wage but the whole social system. Its purest type is found only in the Women's League, but its ideas more or less permeate the 'business' forms. Its effective keynote is sympathy, which has oft-changing foci in spheres of welfare work. Its utility is heightened by the cyclothymic tendency of the sanguine temperament.

3. *Revolutionary unionism* or Syndicalism requires the overthrow of the whole socio-economic order by and for the working class: its variants are socialistic and quasi-anarchistic. The revolutionary advocates direct action and violence; but in contradistinction to this, his philosophy of life is a fixed hypothesis of world passivity, finding its counterpart in his own emotional tone. A parallel is found in the confirmed melancholic who, especially if of advanced years, thinks around set ideas, which in the insane are delusions.

4. *Predatory unionism* is lawless, favours secret violence, and tends to anarchism. It is without philosophy, and seeks only its own immediate advantage. It is based on instinct, acts on impulse, and is more picturesque than significant.

Should this analysis prove fundamentally correct, the problems of trade unionism will be met with much more understanding and sympathy: and the psychiatrist will have a large contribution to sociology in this and other fields.

JOHN GIFFORD.

## TREATMENT.

[207] Re-education of demented patients.—W. A. BRYAN. *Amer. Jour. Insan.*, 1920, lxxvii, 99.

This is a report of work which has been carried on at the Danvers State Hospital, where it has been attempted to adopt ideas of rehabilitation to chronic demented patients and thereby fit them into some social group.

The degeneration of such patients is thought by many to be entirely due to habit deterioration. If so, the principles of treatment are obvious: (1) By training to prevent the formation of vicious habits before they can become fixed; (2) To form new and better habits. Both of these ideas have here been carried out. Primarily some careful analysis should be done to discover the best avenue of approach to interests of the patient; but practical experience has shown that the method of trial and error has to be used. The play instinct is the best opening for most, because of the pleasure involved, the stimulation to imagination, and its possible transformation into useful work. Through a change to better surroundings and where work is being accomplished, the instinct of imitation may be stimulated. The instincts of acquisitiveness and constructiveness, when modified and directed into the proper channels, are productive of wonderful results, and the instincts of affection and sympathy are naturally valuable adjuncts. The fear of social disapproval should take the place of fear of punishment. By putting one strong instinct into competition with another, conduct can be so controlled and modified that the life of the individual may be directed into an entirely different course. In establishing new habits certain primary considerations must be kept in mind. The incentive must be made as strong as possible; they can only be successfully established by continual repetition; and the stimulation which comes from success is essential, while work must not be too difficult or beyond a patient's power. By the cultivation of these powerful instincts much may be done, and the demented individual can be raised to a comparative normality; his life will be more livable, and he can contribute something to the social group. Though no brilliant results are reported, in no case was some improvement not seen.

C. STANFORD READ.



## Reviews.

**Military Psychiatry in Peace and War.** By C. STANFORD READ, M.D. (Lond.), late Major R.A.M.C., Officer in Charge, 'D' Block, Netley. Pp. viii + 168. With 2 charts. Royal 8vo. 1920. London: H. K. Lewis & Co., Ltd. 10s. 6d. net.

DR. READ'S experience of war mental cases was exceptionally wide. From the commencement of hostilities, every Expeditionary Force officer, N.C.O., or private, who evinced mental symptoms which could reasonably be thought to be in any way psychotic, was sent to 'D' Block, Netley. Cases came there from France, Belgium, Italy, Salonika, Palestine, Mesopotamia, Egypt, and India: there were even a few from Russia: and, besides all these, there were some repatriated prisoners of war.

After introductory chapters on the psychology of the soldier, and on military psychiatry during peace, Dr. Read sketches our military organization for care and treatment in the late war, and presents a number of statistical facts and figures. He then gives a well-arranged study of three thousand consecutive cases admitted to 'D' Block in the year 1917, the total number admitted during that year having been 3390. As 'D' Block was a clearing hospital with only 127 beds, the stay of most of the cases there was brief; but Dr. Read has followed up their careers nearly twelve months later by visiting all the various war mental hospitals to which they had been transferred. The study of these cases fills by far the greater portion of the book. The labour necessary to the making of it must indeed have been heavy, especially for an observer so encumbered with routine duties; yet the laboriousness of it is nowhere reflected in his attractively written pages.

In his interpretations of the various clinical pictures, the author lays chief stress on psychogenesis, rather than the overshadowing of physical aspects and organic concomitants. This is due perhaps less to any original bias of his than to the peculiar conditions under which his observations had to be made. Throughout, we have to bear these conditions in mind. They influence, among other things, terminology and diagnosis. To an observer in his predicament it is impossible that, for example, 'dementia præcox' should mean the same thing that it means to the civil psychiatrist who can patiently study his cases over a space of years, and crown his clinical observations with an anatomical research; its centre of gravity is displaced. From the outset we are entangled in comparisons with non-military psychiatry. We are told that though no special war psychosis exists, the environment and circumstances of warfare tend to bring about 'certain' mental reactions which, though seen in other situations, "are

not there so common." The specific action of such factors cannot be tested without a comparison with peace experience; it is impossible to study war psychiatry *in vacuo*. In all generalizations on the subject, such a comparison is implicit and ineradicable; and, as it has to be made, it is best that, in spite of difficulties and pitfalls, it should be made frankly, if the worth of such generalizations as Dr. Read's is to be estimated at all. His readers will certainly make it, each with whatever civil experience he may command.

As regards ratio of insanity to population, Dr. Read says that such figures as he could give would be valueless and misleading, since the population from which his cases were drawn was a continually changing one, and no civil statistics are available for the age period 18-40, within which the soldier mostly falls. And many cases were sent to Netley that would not for a moment have been certified as insane and committed to an asylum in civil life. This, we are told, applies to the mental defectives (13 per cent of the total), all of whom had earned their living prior to enlistment, and to many of the cases of anxiety hysteria, amnesia, psychopathic inferiority, and organic brain disease, so that it seems we should deduct at least some twenty per cent from the total before attempting a comparison with civil asylum experience. As to the remainder, perhaps the relative frequency of the various mental diseases may enlighten us as to the specific effects of war conditions, if, anywhere in the quicksands of classification, we can find rock bottom. We should consider first, of course, diseases in which the personal equation in diagnosis comes least into account—epileptic psychoses and general paralysis.

I have examined the records of male admissions to the Wiltshire County Asylum between the ages of eighteen and forty (excluding any who obviously could never have been acceptable as recruits) for the ten years ending July, 1914. The Netley percentages of epileptic psychoses and general paralysis (1.2, 4.7) are decidedly low, compared with this Wiltshire series (6.5, 10.0). Epileptics had mostly been eliminated from the Army by recruiting boards, or later through a neurological department; but how far can the difference be thus explained? Of Dr. Read's 142 general paralytics, only 61 were under forty years of age, from which it would appear that the percentage of general paralysis for the age period 18-40 must have been even smaller than the figure given would suggest. Probably the figures for this disease are swamped by those for other psychoses, but these are not given in age periods. No doubt there were large numbers of cases of 'situation psychoses', difficult to designate, and quickly recovering when the stressful situation was past. For confusional and paranoid disorders Dr. Read gives large percentages; but here the personal equation operates largely, and no safe conclusion can be drawn. The psychogenetic explanation for confusional disorders is perhaps more plausible than that for paranoid states, whose frequency Dr. Read attributes largely to the psychic effects of military discipline, the wiles of the enemy, and—with a reference to the supposed homosexual basis of paranoia—the herding together of masses of men. We know that a paranoid trend is exceedingly common in psychoses of many kinds; it was observed in at

least 42·7 per cent of cases in my Wiltshire series, and slighter manifestations are to be seen daily in the outside world. It may be noted that in Dr. Read's series there were only ten cases of pure paranoia.

Some such preliminary survey seems necessary, if we would not misconceive the significance of his interpretations. They are suggestive rather than dogmatic. As suggestions, they are of very high interest. Though at times we may feel tantalized by the lack of proof when it seemed so near, the wonder is not that Dr. Read has not given us more, but that he has been able to give us so much—a contribution to British war psychiatry that is, and is likely to remain, unique.

SYDNEY J. COLE.

**Kursus der Psychotherapie und des Hypnotismus (A Course of Instruction in Psychotherapy and Hypnotism).** By GEORG FLATAU. Roy. 8vo. Pp. 174. Second edition. 1920. Berlin: S. Karger. M. 16.

THIS book is based upon a course of lectures to students. A short historical sketch of the development of psychotherapy from ancient times to the present day is outlined. This is followed by a brief exposition of normal psychology, stress being laid upon the interaction of body and mind. The whole subject matter is treated clearly in an elementary, but not dogmatic, manner.

The greater part of the book is devoted to hypnotism, the methods of inducing hypnosis being fully described and their rationale explained. Other forms of suggestion and 'persuasion' are also discussed, and the fact that there is no one method of psychotherapy applicable to all and every case is definitely stated. Yet the author has a very strong leaning towards hypnotism, considering that it leads more surely and quickly to the desired result than do other methods even when the latter are applicable in a given case. In a list of disorders for which hypnotic treatment is recommended one finds 'compulsive ideas' (Zwangsvorstellungen) and 'phobias of every sort'. With regard to the duration of a hypnotic session, he states that this should rarely last less than half an hour; he would incline to a longer session—even following Wetterstrand's method—but for the strain which it imposes upon the operator and the need for it to be carried out in special institutions. The possibilities of doing harm by hypnosis are dismissed as being practically impossible with an experienced operator. The last chapter is devoted to an all too brief review of analytical methods and the theories deduced from them, and more especially to the work of Freud. The author agrees with Mittenwey that the best way of gaining an understanding of the subject is to trace historically its development from the 'Studien über Hysterie': Havelock Ellis has expressed the same opinion. In his own practice the author has not derived much help from psycho-analysis, and he supports Forel's protest against the term 'infantile sexuality'. This last section of the book is not so well balanced as the earlier chapters, and is out of proportion to the whole. It is, however, clearly presented, and is calculated to stimulate

the student to seek further information on the subject which, after all, cannot adequately be dealt with in a book of this character and purpose.

ALFRED CARVER.

**Manual of Psychiatry.** Edited by AARON J. ROSANOFF, M.D., Clinical Director, King's Park State Hospital, N.Y. Fifth edition, revised and enlarged. 8vo. Pp. xv+684. 1920. New York: J. Wiley & Sons. London: Chapman & Hall. 22s. net.

THIS manual, which originally appeared in 1905 as a translation of the French *Manuel de psychiatrie* of de Fursac, has established itself as one of the most succinct, readable, and practical works on the subject of mental disorders. Dr. Rosanoff explains that, in view of the special demands of American students, it has been necessary to make many changes and additions: so the name of the author of the original French version does not now appear so prominently. Perhaps the additions to our knowledge justify the increasing *embonpoint* which begins to characterize this and other text-books of psychiatry: but it does seem a pity that the unfortunate student should have to absorb so much literary adiposity before he can possess himself of the meat of sound doctrine. What he will have to wrestle with in the days to come one trembles to opine. Perchance by then, however, the marrow of the subject may consist in the application of a few well-chosen psycho-analytic formulæ, which will serve to elucidate and to dissipate mental disorders in the incipient stage.

Meantime Dr. Rosanoff and his associates have succeeded in compressing a remarkable amount of information into this volume. New chapters, sections, or appendices, dealing with the following subjects have been added: Applications of psychology in psychiatry, psycho-analysis, applications of sociology in psychiatry, extramural psychiatry, psychoneuroses, hyperthyroidism, and so on. In doing this, the original character of the book has not been lost sight of, and the method of presentation of the new matter conforms to that which has already rendered the manual readable and easy to consult. What has greatly added to its bulk are the huge appendices, one on the Stanford revision of the Binet-Simon intelligence scale, and a second giving the Kent-Rosanoff free-association test. These together take up some hundred and fifty pages. Possibly they would be better published separately: and if this had been done the volume that remained would more certainly have approximated to one's conception of a 'manual'.

One interesting and valuable component is the collation of the references. This will prove of inestimable value to the student in enabling him to turn at once to the standard literature of the various subjects which have to be dealt with briefly in a single volume such as this. It may be remarked, however that in the chapter on dementia præcox no notice is taken of the work of Mott and of John Turner: nor is the question of treatment of this condition by means of nuclein and of nucleinates discussed. Dr. Rosanoff takes a very sombre view of the hysterical personality. He considers that it is in close relation to the criminal, but that there is one



distinguishing trait "which is foreign to many criminals: indolence". Also he is of opinion that "the particular method of therapy is a matter of comparatively little importance in the cure of hysterical manifestations". All who have knowledge of the historical aspect of the subject, or who have had experience of the ways of the hysteric, will probably endorse this dictum.

HUBERT J. NORMAN.

**The Psychology of the Special Senses and their Functional Disorders.**

By ARTHUR F. HURST, M.A., M.D. Oxon., F.R.C.P., Physician and Neurologist to Guy's Hospital. Pp. 123. *Oxford Medical Publications*. 1920. London: Henry Frowde and Hodder & Stoughton. 12s. 6d. net.

THIS book is founded on the Croonian Lectures for 1920. Dr. Hurst defines hysteria as a condition in which symptoms are present which have resulted from suggestion and are curable by psychotherapy. This implies that he considers such symptoms may occur in anyone and not necessarily in hysterical subjects, and that physical stigmata are not present in the patient till looked for. With regard to the mental stigma of suggestibility, the author points out that this is an innate characteristic of everyone and, given a sufficiently strong suggestion, a hysterical symptom may be produced in a person of normal suggestibility.

Dealing with the senses in order, the author first discusses touch. He recognizes anaesthesia due to: (1) Heterosuggestion by the examining physician looking for stigmata; (2) Perpetuation of the anaesthesia accompanying stupor, especially when the suggestion is accentuated by the neurological examinations of the physician; (3) Perpetuation of organic anaesthesia, (a) due to injury of peripheral nerves after the effects of the injury have passed off, or (b) similarly due to temporary injuries to brain and spinal cord; (4) Perpetuation of anaesthesia due to peripheral anaemia resulting from disuse or injury to vessels.

The explanation given of all these forms is the withdrawal of attention from the area of skin involved; moreover, the fact that in extreme cases of hysterical anaesthesia the superficial reflexes may be lost points to an increased resistance somewhere in the reflex arc, presumably at the synaptic junctions. The direction of attention to the afferent synapses, the result of persuasive treatment, presumably reduces this resistance.

Hysterical cutaneous hyperaesthesia is produced by suggestion in the same way as anaesthesia, and is due to the concentration of the patient's attention on a particular area of the body, and this may be intensified by the presence of real pain in this area. So readily is hyperaesthesia induced by suggestion that Hurst regards Head's areas of hyperaesthesia, which were supposed to be due to visceral disease, as essentially unreliable. The perpetuation of pain as a hysterical symptom is of frequent occurrence, since attention is particularly liable to be directed to a painful part, thus lowering the resistance at the afferent synapses.

Hysterical deafness may result from a persistence of concussion deafness, or of that due to temporary meningeal involvement of the eighth



nerve, the idea of complete loss of hearing being suggested by its temporary absence. This deafness is due to the absence of attention increasing the resistance at the synaptic junctions, and this may be sufficiently profound, in severe cases, to interrupt the jump-reflex, which Sherrington has shown to involve no higher level than the mid-brain. The author's observations show that most of the criteria which the text-books lay down as distinguishing organic from hysterical deafness are unreliable, including the supposed association of the latter with anaesthesia of the external ear.

In absolute deafness the vestibular reactions are almost always pathological in organic cases and normal in hysterical cases. The hyperacusis and exaggerated jump-reflex of some nervous patients are explained by the diminished resistance of the synapses consequent on the strained attention of the patient listening for sounds of shells and other danger noises.

Hysterical blindness is capable of a similar explanation to hysterical deafness, namely, the absence of attention which is necessary for looking, consequent on the acceptance of the suggestion that vision is impossible. Hysterical blindness is usually accompanied by, and is particularly due to, blepharospasm and lack of co-ordinate action of the ciliary muscle, and it is by re-education in the proper use of these muscles while persuading the patient to look, that sight is restored. As in the case of deafness, the text-book signs which are said to be diagnostic of hysterical or organic blindness are shown to be unreliable, and the retraction or other alternations of the field of vision on which Charcot laid such stress are the results of suggestion by the examining physician.

The book is very readable, and gives a clear conception of the author's ideas of hysteria. Some will not find themselves in agreement with these, preferring to differentiate habit-continuations of organic disabilities from so-called conversion-symptoms which depend directly on abnormal mental processes. Nevertheless the opinion is becoming more general that although hysterical symptoms may be used by a neurotic patient to compensate and cloak a painful mental situation, yet their origin may always be traced to a suggestion. The unification, therefore, of all symptoms so derived under one heading and definition is desirable and, moreover, pragmatically useful, since the early removal of hysterical symptoms is the ideal to aim at, however complicated a neurosis may be. The only risk of Dr. Hurst's methods is that the inexperienced may fancy that having removed the hysterical symptom he has necessarily completed his duty to his patient. The conception of the lowering of synaptic resistances by the effort of attention is somewhat speculative; but it provides a useful concept, points out a clear method of treatment, and may be provisionally accepted until more detailed knowledge of the subject is available.

R. G. GORDON.

**The Diagnosis and Treatment of Peripheral Nerve Injuries.** The first Report of the Committee upon Injuries of the Nervous System. Pp. 59. Special Report Series No. 54 of the Medical Research Council. 1920. London: His Majesty's Stationery Office.

This first report of the Committee of the Medical Research Council

appointed to deal with injuries of the nervous system contains much useful medical, surgical, and pathological information on the whole question of peripheral nerve injuries in general and of individual nerves in particular. Methods of clinical investigation are described in detail, and the indications for and against operative interference are clearly set forth. Non-operative treatment also receives considerable attention.

The subject of peripheral nerve injuries is in reality so large that the Committee have done well to avoid debatable and purely theoretical considerations and to confine their attention almost entirely to the practical side. At the same time we feel that certain points have not been made as clear as is desirable, doubtless from a praiseworthy attempt at conciseness. It is stated, for example, that in hysterical palsies a muscle which fails to contract in the attempt to make an active movement may yet display its integrity when exercising its synergic function. Such a phenomenon, however, is in no way confined to hysteria. In an ordinary case of hemiplegia the latissimus dorsi may not contract voluntarily and individually although it does synergically. The Committee have noted the common observation that certain muscles may not contract voluntarily after a nerve lesion although their electrical reactions have returned, and consider this defect 'functional but not hysterical'. In view of the obvious confusion arising from such a statement, it is regrettable that the specific meaning attached by the Committee to these terms is not indicated; nor are practical tests for the distinction of the two conditions supplied. We note in particular the apparent absence of any reference to the important phenomenon of defective inhibition of antagonistic muscles as a feature of hysterical motor defect.

The interesting and difficult question of causalgia receives some consideration. The experience of the war has added little to the original clinical descriptions of half a century ago, but important advances have been made in treatment. We gather that only in a minority of cases is operative interference desirable; either resection of a portion of the damaged nerve followed by suture, or injection of the nerve with alcohol well above the site of injury, is advocated. The report does not mention the fact that occasionally one injection proves unsatisfactory, and that a series of injections at several points in the central part of the nerve may give a much better result. Nor is there any reference to the method favoured by some French authorities of dealing with sympathetic periarterial plexuses in this connection.

The general position is adopted that, in the average case of nerve injury, as long a period as nine months of non-operative treatment may be allowed, and that the results of operative interference as late as two years after the injury are not inferior to those obtained by a much earlier surgical treatment. It may, however, we think, be maintained that the patient has nothing to lose and everything to gain by as early operation as possible in cases where the clinician is in any way doubtful of the prognosis. While the Committee give the details of the intervals elapsing between operation and the first return of motion or sensation for the chief peripheral nerves, we should have welcomed any collected statistics as to the actual sequel

of operative handling of such lesions now that sufficient time has elapsed for a review of therapeutic results.

Notwithstanding these and other criticisms that suggest themselves, we can commend the Committee's report as a practical and useful contribution to an important branch of neurology.

**Psychoneuroses of War and Peace.** By MILLAIS CULPIN, M.D. (Lond.), F.R.C.S. (Eng.). Lecturer on Psychoneuroses, London Hospital. Svo. Pp. 127. 1920. Cambridge University Press. 10s. net.

THE main object of this thesis (which was approved for the degree of Doctor of Medicine in the University of London) is to discuss the bearing of the theory of the unconscious upon the psychoneuroses of soldiers, and it is hoped that the practical details given will aid others in treatment. The author is a firm believer in the psychogenesis of the various morbid symptoms met with, and finds their pathology satisfactorily explained by the psychological mechanisms of repression and dissociation. Though in many ways Freud's theories are here supported, the nosological conceptions of Janet are followed as well, so that we find psychasthenia prominently in the classifications used, though the anxiety state is considered separately. Dr. Culpin does not seem to regard the anxiety state as being hysterical in nature, and all that is not somatic symptomatically is either grouped under the anxiety conditions or under that somewhat vague term psychasthenia. Thus hysterical phobias do not seem to be recognized, and stammering and amnesias do not come under the heading of hysteria.

It is patently a difficult task to describe adequately in a few pages the psychopathological mechanisms involved in the psychoneuroses, and one might here allude to some doubtful statements which are made. Can we scientifically say that the stream of consciousness receives 'ideas' from the outside world? Should one conceive the 'conscious' and the 'unconscious' blending one into the other? From a strict psycho-analytic standpoint the term 'repression' is used where 'suppression' should be, as repression is looked upon as purely an unconscious condition, whereas suppression can be carried out either consciously or unconsciously.\* Some other loose phraseology might also be drawn attention to. It may be pointed out here that McDougall has lately amended his definition of suggestion, which the author quotes, for as it stood it implied that the suggested proposition is necessarily one which cannot be logically justified. Hence his interposition of the words, "independently of the subject's appreciation". Dr. Culpin agrees with some of Babinski's views, but he regards his ideas as imperfect because the latter takes no account of the important factor of the affective state and neglects the question of repression. The author gives the main factors in the production of the psychoneuroses of war as: (1) Repression of fear of danger and discomfort; (2) A weak herd instinct; (3) Stress of immediate surroundings. He also describes a

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\* The energy expended in repression is preconscious, but in suppression it may be a conscious expenditure.

small but well-defined group where no repressions are found, but a fairly constant sequence of cause and effect. The development of these disorders is not discussed deeply, and many psychopathologists would tend to regard the problem as much more complicated and abstruse than one would gather from these pages. Is it true to say that the symptoms of an anxiety state bring no advantage to the sufferer? Surely, as in conversion hysteria, defence mechanisms are at play, and, as McCurdy and others have pointed out, the choice of neurosis depends largely upon the type of mentality, the uneducated private becoming the subject of conversion hysteria, while the officer develops an anxiety hysteria.

Under treatment, the methods of suggestion, persuasion, abreaction, hypnosis, and analysis are discussed. In the revival of memories, association in the hypnoidal state was used in preference to free association, and word association was found to be a useful adjunct. Dreams are considered from the point of view of a symptom, a means of approaching repressions, and as a standard of recovery. Various types of war dreams are given.

The second half of the book is devoted to cases illustrating phobias, obsessions, hysterical fits and epilepsy, stammers, tremors, amnesias, pathological irritability, and difficulties in diagnosis. In summarizing, the author regards the psychoneuroses of war as comparatively easy to treat, and on the whole is fairly satisfied with his results, but believes civilian cases to be much more complex and difficult to handle. He concludes by stating that his results find their readiest explanation if we accept Freud's theory of mechanisms, and that to a large extent "the theory of the unconscious must be admitted as necessary to the understanding and treatment of the psychoneuroses".

The book is very readable, and many will doubtless glean much which will be helpful towards a better understanding of the war patient.

C. STANFORD READ.

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EDITORIAL NOTE.—We have received a communication from Dr. C. Stanford Read with regard to his review of Freud's "A General Introduction to Psychoanalysis", which appeared in the last number of the JOURNAL. Dr. Read desires to point out that the criticisms with regard to the use in the book of certain terms (p. 306) refers solely to the American translation. He understands that another translation is being prepared in this country.

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Deputy Superintendent, Whittingham  
County Asylum.
- C. P. SYMONDS, M.D., M.R.C.P. Assistant  
Physician for Nervous Diseases, Guy's  
Hospital, London

## Psychopathology

- BERNARD HART, M.D., M.R.C.P. Physician  
for Mental Diseases, University College  
Hospital; Lecturer in Psychiatry, Uni-  
versity College Hospital Medical School,  
London
- HENRY DEVINE, M.D., F.R.C.P. Medical  
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Portsmouth
- MAURICE NICOLL, B.A., M.B. Late Medical  
Officer, Empire Hospital for Injuries of the  
Nervous System, Vincent Square, London;  
Lecturer in Psychotherapy, University of  
Birmingham
- C. STANFORD READ, M.D. Physician,  
London Neurological Clinic, Ministry of  
Pensions; Consulting Psychiatrist to Fish-  
erton House Mental Hospital, Salisbury

CAREY F. COOMBS, M.D., F.R.C.P. Physician, with charge of  
Out-patients Bristol General Hospital *Editorial Secretary*,  
Bristol

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# THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

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## Original Papers.

### SOME PROBLEMS IN NEUROLOGY.

By S. A. KINNIER WILSON, LONDON.

#### I.—THE ARGYLL ROBERTSON PUPIL.

CONTRIBUTIONS to the study of the Argyll Robertson phenomenon have been so frequently introduced by allusions to its prominent rank as one of the vexed questions of neurology that omission of such preliminary matter may be not unwelcome. If, none the less, the problem still awaits full solution, the lines of approach have been laid down, and clinico-pathological as well as experimental data, whose import is not to be mistaken, have been steadily accumulating. In this paper fresh evidence is furnished pointing to the central origin of the disorder, and a new and simple explanation is proffered for its common occurrence in neurosyphilis.

Strangely enough, doubt still exists as to what actually constitutes the Argyll Robertson pupil, and unless unanimity is reached such horrid expressions as 'a pseudo-Argyll' will continue to blot the pages of what is euphemistically called medical literature. The point is simply whether myosis is or is not to be taken as an integral part of the symptom-complex. Under the title "Four cases of spinal myosis, with remarks on the action of light on the pupil", Argyll Robertson<sup>1</sup> published in 1869 a series of cases, chiefly of tabes dorsalis, in which he observed the phenomenon since associated with his name. Present-day opinion, however, with few exceptions, holds myosis to be facultative and not obligatory, so that the sign may be defined as consisting in absence (or obvious diminution) of the direct reflex to

light, the consensual reflex being either absent or present, with preservation of the pupillary reaction on convergence-accommodation. That this is the soundest view to take is substantiated by the fact that myosis may occur without the dissociated-reflex\* phenomenon of the A.R. pupil, and vice versa, and since two different mechanisms are involved they should be considered separately. Why some 30 per cent or more of A.R. pupils should also be myotic is a point of legitimate importance, discussed below. Vision is assumed more or less tacitly to be unimpaired in the A.R. phenomenon, but there seems no good reason to exclude cases of relative blindness which exhibit the dissociated reflex, though in this paper such are omitted. A frequent but not perhaps constant correlated feature of the A.R. phenomenon is absence of dilatation of the affected pupil on painful stimuli from the trigeminal area or elsewhere. Irregularity or inequality of the pupils in the condition is incidental.

#### CLINICAL CONDITIONS IN WHICH THE A.R. SIGN IS FOUND.

1. The A.R. pupil thus defined, our first concern is with its clinical incidence. As all the world knows, the A.R. phenomenon is encountered in a high percentage of cases of neurosyphilis, of whatever variety, though it cannot be taken as pathognomonic of that morbid condition, or as an infallible index to preceding syphilis. Recall of the prime neurological principle that symptoms depend less on the nature of the pathological process in the nervous system than on its site and the mechanisms involved should have led to hesitation in assuming a unipathological basis for the phenomenon. For the moment, however, the point is that, neurosyphilis being essentially a diffuse toxi-infective state, the peculiarly specific and local action of the spirochæte or its toxin on a particular mechanism will require an explanation which is both simple (for the A.R. pupil is very common in neurosyphilis) and in harmony with the occurrence of the sign in non-syphilitic cases.

By way of illustration only a single example need be given, selected because of the combination of unilateral myosis and bilateral A.R. pupil.

*Case 1.*—S. S., female, age 40, has a strongly positive Wassermann reaction in the blood, but no signs whatever in the nervous system except a double A.R. phenomenon. The right pupil is in a state of myosis and measures  $1\frac{1}{2}$  mm. in diameter; the left, on the contrary, is rather large, in diameter 5 mm.; yet both show the typical dissociated reflex, and from neither is a consensual light reaction obtained in the other.

---

\* I use the expression 'dissociated reflex' only for convenience of description; the reaction of the pupil on accommodation-convergence is not a 'reflex' but rather an 'associated movement'.

This case illustrates the impracticability of attempting to restrict the A.R. sign to the myotic eye, for in all other respects the phenomenon is identical in the two.

2. Of no less importance, if of minor frequency, is the occurrence of the sign in cases of nervous disease altogether independent of syphilis. Still confining our attention to the toxi-infective group, we must emphasize its occasional appearance in the course of epidemic encephalitis. In a recent monograph Tilney and Howe<sup>2</sup> state that manifestations due to interference with the oculomotor apparatus have been present in 53 per cent of the reported cases, and specify the occurrence of unilateral or bilateral paralysis of pupil-movement on accommodation, dissociated from light-reflex involvement—i.e., the reverse of the A.R. phenomenon, in a sense, for they do not, apparently, point out that the former may be merely the sequel to a paralysis of convergence. The true reversed A.R. pupil consists in absence of reaction on actual convergence of the globes, with presence of the pupillomotor reflex to light. I have, however, seen at least one case of A.R. pupil in the disease.

*Case 2.*—In a paper<sup>3</sup> on epidemic encephalitis a case was detailed, of the mild recovering type, in which bilateral ophthalmoplegia externa was an early and marked symptom. The pupils, rather large and slightly unequal, reacted to light very sluggishly indeed; convergence was impossible, nor was there any pupil movement in the attempt. At a later stage, however, uninterrupted improvement resulted in the complete disappearance of the external ophthalmoplegia, but the light reaction remained greatly impaired. After the paper was written I saw the patient on several occasions, and was able to satisfy myself that the response on convergence had become normal while the reflex to light was still (December, 1918) very imperfect. That is to say, the condition approximated closely to the ordinary A.R. phenomenon. Both in blood and spinal fluid, syphilitic tests always proved negative.

It is known, of course, that reaction of the pupil may take place in an eye paralyzed for convergence, on an attempt at the latter being made. Thus Guillain<sup>4</sup> has reported an interesting case of unilateral A.R. sign in a patient with a typical syndrome of Weber (non-syphilitic); the left eye showed the A.R. phenomenon, and was also the one paralyzed by the oculomotor lesion. When the patient converged, the right eye moved in and its pupil contracted, and simultaneously the left pupil contracted strongly though that eyeball did not move at all.

3. Again, the sign has been observed occasionally in unmistakable cases of disseminated sclerosis. It was found by Uthoff<sup>5</sup> only once in one hundred cases, but it has been seen also by Probst,<sup>6</sup> Pini,<sup>7</sup> Marburg,<sup>8</sup> Rad,<sup>9</sup> Liwsehütz,<sup>10</sup> and others. Rad's two cases, in particular, do not appear to leave any room for doubt. I have myself seen one typical example in the disease.

*Case 3.*—The patient was a young girl of 22, who came to the National Hospital complaining of paræsthesiæ in the limbs and of dimness of vision of subacute onset. On examination, the abdominal reflexes were absent and the plantars were in extension. Nystagnoid jerking was noted on lateral deviation. Investigation of the blood for syphilis proved negative.

Both pupils were rather dilated (diameter 5 mm.) and completely inactive to strong light, direct or consensual, but they reacted quickly on convergence. The optic discs were normal. I showed the patient to my colleague, Dr. James Collier, who corroborated the A.R. finding, and agreed that the case was one of early disseminated sclerosis.

As the patient disappeared from observation not long afterwards, further survey of the case became impossible.

From the foregoing it is apparent that a characteristic A.R. phenomenon is an occasional occurrence in diffuse toxi-infective states other than neurosyphilis, and surprise might be justifiably expressed if this were not so, for diffuse morbid processes must sometimes light on the same area and disturb the same mechanisms as are implicated in the A.R. pupil of syphilis.

4. The not infrequent development of the dissociated reflex, as a stage towards, or without going as far as, complete fixity of the pupil, has long been recognized to accompany certain cases of cerebral tumour in the vicinity of the third ventricle, aqueduct, or anterior corpora quadrigemina; but this knowledge does not appear to be widely diffused outside neurological circles. Yet these are the cases which furnish the most valuable clue to the general, i.e. commonest, site of the lesion underlying the A.R. sign, and are of significance out of all proportion to their comparative rarity. Two or three illustrative instances from personal observation may be given in some detail.

*Case 4.*—A. B., male, age 19, came to hospital complaining of headache, lassitude, inclination to sleep, vomiting, diplopia, and an uncertainty of gait. On examination, intense double optic neuritis was found (highest point +6D); there was no ptosis or nystagmus, but conjugate upward movement was defective, and there appeared to be some very slight general weakness of the right limbs: cutaneous and deep reflexes alike, however, showed no deviation from the normal.

The pupils were of medium size: the left was quite inactive to light, and the right responded with great sluggishness, while both reacted briskly on convergence, i.e., there was a double A.R. pupil.

From the defect of upward movement the lesion was with some certainty attributed to the region of the anterior corpora quadrigemina, and it was held that the double A.R. pupil supported this localization. Improving somewhat under general treatment, the patient left without operation after a stay of some ten weeks.

He was seen again almost exactly four years later, and reported himself as quite well and at work. The optic discs were entirely normal, with normal physiological pits. Conjugate upward movement was greatly impaired, in fact almost lost, the eyes tending instead to converge with the effort. No other symptom was present, except that both pupils were



slightly but definitely irregular, medium in size, and exhibited a typical dissociated A.R. reaction on both sides, being immobile to bright light, direct and consensual, but responding actively with accommodation-convergence. On this occasion opportunity was taken to examine the blood for the Wassermann reaction, which was found to be negative.

No doubt can be entertained, I consider, that the case was one of cerebral tumour in the neighbourhood of the superior colliculi, the paralysis of conjugate upward movement being highly characteristic of lesions involving the tectum opticum, and the accompanying typical A.R. sign must similarly be attributed to involvement of some structure or structures in the same part of the mesencephalon.

*Case 5.*—C. D., male, age 42, was admitted to hospital with a six months' history of headache, giddiness, diplopia, staggering gait and a tendency to deviate to the left, and increasing drowsiness and apathy. On examination the patient was found to have advancing optic neuritis in both eyes, highest point +5 D. There was gross defect of upward movement, the effort always leading to slight divergence merely, with closure of the eyes. Convergence was fair on both sides, though less on the left than on the right. The pupils were equal in size, diameter  $2\frac{1}{2}$  mm., and entirely immobile to light, consensual or direct; but both reacted through a fair range, though not briskly, on convergence. No dilatation of either pupil was obtained on painful stimulation of the skin of neck or cheek. A decompression operation was undertaken without any resultant improvement, and some weeks later death ensued.

At the autopsy a tumour was found involving both anterior corpora quadrigemina and the vicinity of the aqueduct generally, which proved on microscopical examination to be a glioma.

In this case the same combination of double A.R. pupil and paralysis of upward conjugate movement of the eyeballs occurred, and the diagnosis of tumour of the superior colliculi was amply confirmed by subsequent pathological investigation.

*Case 6.\**—E. F., male, age 24, was admitted to hospital with a history that for three months he had suffered from headache, and that during the last week or two his vision had begun to fail. Examination revealed intense double optic neuritis, and pupils which were rather large ( $5\frac{1}{2}$  mm.) and immobile to light. There was no ocular paralysis at this stage, and though convergence was good the accompanying pupillary contraction was almost nil. A fortnight later associated upward movement of the eyes became very imperfect, and the pupils had come down to a diameter of  $3\frac{1}{2}$  mm., the light reflex still being absent. Six weeks later upward movement was completely paralyzed, and while the light reflex was lost both on direct and consensual stimulation, the reaction on convergence was brisk, i.e., a double characteristic A.R. sign was obtained.

Operation was offered, but, the patient's friends refusing consent, he was removed from hospital.

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\* For permission to refer to this case I am indebted to my senior colleague at Queen Square, Dr. James Taylor, whose house physician I was when the patient was under his care.

The importance of this case, apart from its identity with the preceding two as far as the combination of the A.R. pupil with tumours of the superior colliculi is concerned, resides in the proof it furnishes of variability under observation of the phenomenon itself and of the accompanying pupil changes. Thus the original stage of dilated and almost fixed pupils was followed by one of reduction in size coupled with the appearance of a typical A.R. sign, the former being associated with normal eye movements and the latter with complete paralysis of conjugate upward deviation. Since there is a common idea that in neurosyphilis the A.R. phenomenon, once developed, is a fixture, special attention must be drawn to the fluctuating nature of the dissociation in certain cases of mesencephalic lesion, a variability which is only to be expected, but which, at the same time, is of considerable pathogenic significance.

The occurrence, then, of the A.R. pupil in connection with non-syphilitic lesions in the vicinity of the aqueduct and anterior corpora quadrigemina is amply proved, and renders pointless the *ex cathedra* criticisms of Dunn,<sup>11</sup> who declares that "it is impossible for me to understand how a tumour in the region of the third ventricle can produce a typical Argyll Robertson pupil. Every fact of the history of the growth of brain tumours and every fact of the history of the Argyll Robertson pupil pleads against such a possibility" (*sic*). His dogmatic assertions, however, are somewhat discounted by his admission that he has never seen a case of mesencephalic tumour and by his uncompromising adherence to the view which assigns myosis an integral share in the syndrome.

Analogous instances from the literature are rather few and far between, but an excellent case is the old one of Moeli's<sup>12</sup> (1887): in it a typical bilateral A.R. sign (pupils 5 mm. in diameter) resulted from a tumour of the third ventricle in a man of 57, vision being unaffected. From Weisenburg's<sup>13</sup> useful paper on tumours of the third ventricle it would appear that 'impaired pupil reactions' have been often observed, though the A.R. sign is not specifically mentioned. In this respect, however, many of the cases quoted by Weisenburg from the literature have been very imperfectly examined. The reader may also be referred to *Case 2* in a paper<sup>14</sup> on ectopia pupillæ in mesencephalic lesions, where the pupils were unequal, with sluggish reaction to light and brisk response on accommodation, and where the lesion was a colloid tumour of the third ventricle. Jelliffe and White<sup>15</sup> state that the A.R. pupil has been found in cases both of third-ventricle and of pineal tumour, but do not give references. Farquhar Buzzard<sup>16</sup> has also stated that he has seen the phenomenon in non-syphilitic cases of mesencephalic tumour, those he briefly describes being for all practical purposes identical with my own in

the combination of the A.R. sign with paralysis of vertical movement of the eyes. To the objection of Cestan and Dupuy-Dutemps<sup>17</sup> that the sluggishness or fixity of the pupillary reflex to light in tumour cases is due to concomitant amaurosis the result of the optic neuritis, that such pupils are always dilated, and therefore that the condition is a 'pseudo-Argyll Robertson sign', there is a ready answer: many cases of optic neuritis are not accompanied by any defect of vision. Vision was perfectly normal in *Case 4* (A. B.) above, and but little diminished in *Case 5* (C. D.), while in *Case 6* (E. F.) the pupils were large and immobile to light at first and actually became smaller as the disease progressed and as vision became impaired. Moeli's case, too, disproves the contention.

5. Reflex iridoplegia, again, has been described in syringomyelia or syringobulbia (Lévi and Sauvinau,<sup>18</sup> Dejerine and Mirallié,<sup>19</sup> Sicard and Galezowski,<sup>20</sup> Rose and Lemaitre,<sup>21</sup> and others). In Dejerine and Mirallié's case the A.R. phenomenon was unilateral, as in the case of Sicard and Galezowski, and in one of two published by Rose and Lemaitre. Interesting though these records are, their value would be increased were information as to the pathological lesions forthcoming.

The occurrence of the A.R. pupil in chronic alcoholism has been reported, among others, by Nonne,<sup>22</sup> whose case certainly appears entirely free from criticism: in it the Wassermann tests were repeatedly negative. One such case has come under my personal observation.

*Case 7.*—J. S., male, age 58, was under my care at the National Hospital for nervous symptoms associated with chronic alcoholism. He had long been known to be a chronic tippler. I was called to see him at his own home one day, the history given me being that he had fallen in the street and had remained unconscious for almost twenty-four hours. On regaining consciousness he was confused and disoriented, and complained of his vision being 'funny'. When I examined him I found the optic discs quite clear. The pupils were rather small and absolutely immobile to bright light—on previous occasions their reactions had always been normal—both direct and consensual, whereas they reacted slightly but definitely on convergence. This movement of convergence, it should be said, was poor, and ocular movements generally were poor in range and not particularly well sustained in any direction. A diagnosis of polio-encephalitis hæmorrhagica superior was made. After about six weeks, when the patient visited hospital again, both the light and the convergence movements of the pupils had much improved.

It is true that in this case a Wassermann test was not made, but apart from this regrettable omission I submit that the known facts in connection with the case substantiate the clinical diagnosis.

Biermann<sup>23</sup> has put on record a good case of the A.R. pupil in diabetes mellitus, Wassermann tests being repeatedly negative. Mention may also be made of the development of the sign in the chronic

hypertrophic interstitial neuritis of Dejerine-Sottas, and in some reported cases<sup>24</sup> of progressive muscular atrophy or amyotrophic lateral sclerosis. But no such cases can now be accepted as genuinely non-syphilitic unless they have run the gauntlet of serological and spinal-fluid tests.

6. Of considerable interest and importance are the examples of the phenomenon of traumatic origin: in fact, a surprising number have now been put on record, many of which are beyond cavil genuine A.R. cases.

Two groups may be distinguished: (*a*) cases in which the lesion is in or behind the eye itself: and (*b*) cases in which the lesion is in the central nervous system. To the first of these belong the cases of Axenfeld,<sup>25</sup> in one of which the eye itself was injured by a splinter of wood: with vision  $\frac{6}{25}$ , and a large pupil immobile to light, a prompt reaction on convergence was nevertheless obtained. Analogous examples of A.R. pupil from direct unilateral lesion of globe or orbit have been published by Cosmettatos,<sup>26</sup> Ohm,<sup>27</sup> Velter,<sup>28</sup> Abelsdorf,<sup>29</sup> and others. In Ohm's case a splinter of iron entering the eye was followed by a mydriasis traumatica and fixity both for light and convergence: several months later the reaction on convergence returned, thus leaving a pure A.R. pupil, with good sight. Velter's case was that of an attempted suicide, with an orbital smash from a revolver bullet: a complete unilateral A.R. pupil resulted. Other examples of the condition have followed fractures of the base (Axenfeld). In the second group are the bilateral cases resulting from central traumatic lesions. Finkelnburg<sup>30</sup> has reported a case in an old man on whose head fell an iron instrument weighing some 150 lb., unconsciousness immediately resulting. In addition to general intracranial symptoms of concussion or contusion, the patient developed a bilateral A.R. phenomenon within a week or two of the accident, and the suggestion is that they were due to minute hæmorrhages in the peri-aqueductal grey matter and consequent degeneration. A particularly interesting case is that recorded by Bergl.<sup>31</sup> The patient was a soldier concussed by the explosion of a shell twenty feet away: in addition to familiar symptoms of intracranial commotio, within a few days a typical double A.R. pupil was found, the pupils being rather large, and yet after some three weeks of continuous observation the phenomenon disappeared entirely and pupillary reactions became normal. Of other traumatic central cases that of Guillain, Rochon-Duvigneaud, and Troisier<sup>4</sup> may be briefly mentioned.

The patient was a young man of 26 who had attempted suicide with a revolver, the bullet entering on the right side of the neck just at the level of the hyoid, and being found by x-ray examination to have lodged in the



position of the right cerebral peduncle. A complete left hemiplegia ensued, with left hemianopia, some ptosis, weakness of some ocular muscles on the right, and a classical A.R. sign on the right and incomplete on the left (this pupil reacting sluggishly to light). Repeated examination of the spinal fluid for evidence of syphilis proved negative. It should be stated that the A.R. pupil developed under observation, for it was not present in typical form when the patient was admitted to hospital shortly after the injury.

Further reference to these traumatic cases is made in a later paragraph.

From a consideration of the clinical material, personal and otherwise, at our disposal, pathological multiplicity for the A.R. phenomenon must be accepted, in which case questions as to its diagnostic and prognostic import assume a subsidiary position. Recourse to serological and spinal-fluid tests has taken the place of unsatisfactory speculations on the A.R. pupil as a criterion of active syphilis. It may undoubtedly remain as a neurosyphilitic 'scar' long after active mischief has ceased, and cannot be held to be prognostic of anything. Its localizing importance, on the other hand, is fundamental, and is intimately bound up with the difficult question of its pathological physiology.

#### THE ANATOMO-PHYSIOLOGICAL ARC FOR THE LIGHT REFLEX.

When light falls on the eye the physical stimulus sets in action two physiological mechanisms, one concerned with vision (the 'sight' mechanism) and the other with reflex contraction of the pupil (the 'light' mechanism). That these are physiologically distinct can admit of no doubt, though whether they are also anatomically separable is possibly not so certain, Magitot's<sup>32</sup> contention being that the reflex-activating fibres are no more than collaterals of the visual fibres, leaving the tract at a point near the external geniculate body. The following considerations, however, must be borne in mind.

1. The presence of both thick and thin fibres in the optic nerve and tract, the former of which were traced by Monakow to the superior colliculi, but none of the latter, suggests a difference of function (substantiated also by Reichardt's<sup>33</sup> case), to which, further, the existence, according to Cajal,<sup>34</sup> of single and multiple combinations in the retina of ganglion cells with bipolar cells and rods or cones lends support; his plausible hypothesis is that the single combinations subserve vision and the multiple the light reflex.

2. In spite of the general truth that vision and reflex activity to light diminish *pari passu*, so that in complete optic atrophies the pupils are often immobile, the exceptions are so numerous as to suggest an anatomical as well as the accepted physiological distinction between the two systems. In optic neuritis, optic atrophy, detachment of



the retina, quinine amaurosis, etc., vision may be lost yet the pupillomotor reflex may persist: on the other hand, Axenfeld's and other peripheral traumatic cases show that with loss of the light reflex vision may persist. To assume an anatomical difference, represented also by the difference in susceptibility or vulnerability, does not appear unjustifiable, although the subject could do well with less speculation and more patient anatomical research. In this connection the case published by Reichardt<sup>33</sup> may be quoted, one of optic atrophy and amaurosis with conservation of the light reflex. Histological examination revealed persistence of a large number of undegenerated optic nerve fibres, whence it might be deduced that these were capable, during life, of mediating the light reflex but incapable of provoking a quantitative sensation of light (Magitot<sup>32</sup>). But this interpretation (which is not Reichardt's, be it noted) is at least doubtful, since the excellent researches of Léri<sup>35</sup> on tabetic optic atrophy have shown how few need be the persisting fibres in the optic nerve to allow of the appreciation of light stimuli.

However this may be, a physiological differentiation for reflex impulses as opposed to visual impulses must be fully admitted: the physiological results both of stimulation and of destruction of the external geniculate body are quite different from those relating to the superior colliculi, and prove the pupillary and visual paths are not identical.

Omitting in this place the question of the exact retinal origin of the light-reflex fibres, and leaving the visual route aside, we may proceed along the reflex pupillomotor path. It undergoes a partial crossing in the chiasma (analogous to the visual crossing), as is shown by the researches of Cajal and of van Gehuechten. Parsons<sup>36</sup> states that this partial decussation is also "proved by the hemiopic pupil reaction of Wernicke": but less reliance can be placed on that reaction since the studies of Walker<sup>37</sup> have demonstrated its occurrence in some cases of posterior hemianopia, i.e., due to lesions behind the level of the external geniculate body, and an equally convincing case has been published by Dejerine and Jumentié,<sup>38</sup> the lesion being a hæmorrhagic softening which had destroyed, *inter alia*, the optic radiations posterior to the basal nuclei.

In the optic tract the pupillomotor reflex fibres can be followed to a point just before the external geniculate body is reached. The best method of physiological demonstration in this respect, that of constriction of the pupil by electrical stimulation of the optic nerve, has been utilized by Karplus and Kreidl,<sup>39</sup> who have found that all along the optic tract, except where it enters the lateral geniculate, electrical excitation contracts the pupil, and these pupil-controlling fibres can be followed, millimetre by millimetre, along the superior

brachium (or 'arm' of the corpus quadrigeminum anterius) and the anterolateral edge of the superior colliculus. At this point the electrical effect is again lost. From these important experimental results it may be taken that the pupillomotor reflex path avoids the external geniculate body and passes to the grey matter of the superior colliculus by the brachium. After bilateral section of the superior brachium the reaction of the pupils to light is absent: in this fashion Karplus and Kreidl have, in the ape, produced a bilateral A.R. sign which remained unchanged for eight months after the operation. They do not assert that in the A.R. phenomenon in man the lesion is of necessity at the same spot where they have been able to produce it experimentally, but their results are obviously of the first importance.

At this stage, however, it is desirable to deal with the arguments denying to the superior colliculus and its brachium a place in the linked chain from retina to iris. Omitting the early experiments of Knoll (1869) and Beecher (1884) we may consider the researches of Ferrier and Turner (1901).<sup>40</sup> These investigators destroyed with a cautery the region of the superior and inferior colliculi in seven monkeys; in all the experiments, with one exception, the pupils after the operation were contracted to the size of pin-points, but only temporarily, for after two days they returned to their natural size. In the author's own words: "As regards the pupillary light reaction, *in the cases in which it was tested it appeared to be present (so far as reliance may be placed on this reaction when tested in animals, where it is so difficult to eliminate the complication of convergence and accommodation)*" (italics mine). To the evident hesitation of the authors themselves in the matter, further doubt is added when it is remarked that a perusal of their protocols shows apparently that only one animal is recorded as having had its pupil reactions tested, and in it (see their Fig. 1) "the anterior border of the nates on the left side, and the posterior margin of the testes" remained. Thus their work can *not* be taken to prove that the whole anterior colliculus may be destroyed without preventing the light reflex, both because of the limited number of animals in which the pupillary reflexes were investigated and the admitted difficulties in the way of testing, and because in view of the uncertain path of the light reflex fibres from brachium to oculomotor nucleus no adequate proof is forthcoming from the experiments that these fibres could not have escaped. In fact, the complexity of cells and fibres in and beneath the superior colliculus is such that cases of incomplete lesion of that structure without apparent pupillary disorder cannot be taken to invalidate the views here advanced.

Special stress is laid on this matter, because Ferrier and Turner's experiments have been cited over and over again as supposedly proving that the superior colliculi have nothing to do with the light

reflex (Lhermitte,<sup>41</sup> for example, states that these observers “n’ont pu obtenir chez le chat ou le singe aucune modification de la réflexivité pupillaire par l’ablation de la paire antérieure des tubercules quadrijumeaux”).

The experimental work of Levinsohn<sup>42</sup> must also be noticed. This observer destroyed *one* superior colliculus only in each of three apes, and after a few days found normal light reflexes in both eyes in them all. From the photographs accompanying the paper it is not very clear precisely how much of the colliculus was destroyed; in one, at least, much of the peri-aqueductal grey matter seems to have been left intact. Nor is there mention of microscopical investigation of a sufficiently detailed character. Levinsohn does not state whether direct or consensual testing was made, and since only one colliculus was injured the experiments are open to some indefiniteness of interpretation.

Undoubtedly the crux of the whole question lies in the fact that the exact anatomical pathway from the anterior colliculus to the sympathetic nucleus in the oculomotor nuclear system has not yet been definitely traced, yet the difficulty resides not in poverty but in plenitude of neuronal connections. As Edinger<sup>43</sup> says, “Fasernetze und Züge, durch welche die Verbindung stattfinden *konnte*, sind in dieser Gegend mehrfach vorhanden. Das beweisende Experiment oder die beweisende klinische Beobachtung mit nachträglich erhobenem Befunde steht noch aus”. It may be assumed with a considerable degree of certainty that the light-reflex neurones whose origin is retinal end at the level of the brachium or superior colliculus—for after enucleation of the eyeball Probst<sup>44</sup> has not been able to trace degeneration beyond the latter structure—and that there they enter into connection with a new set. Of the various more or less alternating layers of grey and white matter in the superior colliculi, certain cells and arciform fibres therefrom derived, belonging to the deepest layer, engage our attention. They constitute the colliculonuclear tract, which takes origin especially in the large cells of the fourth layer and has both a direct and a crossed connection with the mid-brain: the latter is made via the “fountain-like” decussation of Meynert, whereby collaterals and terminal branches reach the oculomotor nucleus (and also the other ocular nuclei), while the uncrossed fibres descend to terminate in the homolateral third-nerve nucleus and in the others also (Tilney and Riley<sup>45</sup>). According to this description the crossed fibres skirt the aqueduct below to reach the opposite oculomotor cell-groups, but of no less importance is the dorsal crossing above the aqueduct, with subsequent connection to the opposite nuclei, as already mentioned. This lamina commissuralis mesencephali (Edinger) is to be distin-

guished from the posterior commissure which lies in front of it, and with which it has been erroneously confused.

Above, below, and laterally these fibres of the colliculonuclear system skirt the central grey matter of the aqueduct, and would be the first to suffer from any peri-aqueductal toxic invasion. The significance of this statement is discussed more fully in a subsequent section.

In this fashion both the direct and the consensual reflex response of the pupil to light can be readily explained. If there is, as has been already stated, a partial decussation of pupillomotor reflex fibres in the chiasma, such a further semi-decussation on the afferent side of the oculomotor nuclei must be conceded; otherwise the consensual reaction from the temporal side of the retina of the affected eye in a case of unilateral A.R. sign could not be explained, as has been well pointed out by Harris.<sup>46</sup> The same author's study of the mechanism of the pupil reflex to light in animals and birds "proves the necessity for a posterior decussation of the pupil-reflex fibres between the corpus quadrigeminum or optic lobes and the third nuclei, total for those animals with total decussation of the optic nerves at the chiasma, and partial for those animals with semi-decussation of the optic nerves, in proportion to the size of the uncrossed bundle".

Though the experimental and clinical evidence now adduced argues strongly in favour of the passage of the light reflex by the superior colliculi, not a few writers have suggested a route which avoids these structures, viz., by the tractus peduncularis transversus, a fibre-system of uncertain origin and ending, which apparently leaves the optic tract at the outer side of the crus and skirts the latter mesialwards to enter the mid-brain at the side of the emerging fibres of the third nerve. Here it appears to end in, or reach, a small nucleus first described by Bechterew and by Marburg, which nucleus, according to Edinger,<sup>43</sup> represents a part of the ciliary ganglion that has not wandered out to the orbit. While further research may enlighten us as to the anatomy and physiology of this tract, our present knowledge is insufficient to justify any speculation as to its possible connection with the pupillomotor reflex.

Of other definite internuncial paths in the vicinity, reference may be made to the fasciculus longitudinalis dorsalis of Schütz, also known as the peri-ependymal longitudinal tract, consisting of a set of fine myelinated fibres immediately under, and above, the ependymal lining of the aqueduct, and therefore actually in the peri-aqueductal grey matter. Arising in a mesencephalic nucleus, the nucleus dorsalis tegmenti of Gudden, the tract seems to be of much less importance in man than in lower animals, since it represents a primitive motor pathway between the olfactory lobe and the ocular and lower



cranial musculature. For anatomical and comparative anatomical reasons, and notwithstanding its ocular connections, this tract cannot be supposed to mediate the nerve impulses from tectum opticum to oculomotor nuclei, disorder of which is responsible for the A.R. pupil. Similar statements may be made of the familiar posterior longitudinal bundle—another and more important (partially descending) mesencephalic pathway. Linking up, *inter alia*, vestibular and ocular apparatus, and extending as far forward, apparently, as the regio hypothalamica, the bundle nevertheless does not furnish clear anatomical proof of conveying impulses from intercalated collicular neurones to the intrinsic oculomotor nuclei. Finally, there remain the tectobulbar and tectospinal tracts, which arise in the grey matter of the superior colliculi and constitute the outer section of the arciform fibres alluded to above as originating in the deeper cell layers of the tectum. They cross below the aqueduct in the dorsal tegmental decussation of Meynert, between the twin red nuclei. The evidence suggests that these pathways serve to activate reflex movements in ocular, facial, neck, trunk, and arm musculatures in response to light stimuli via the anterior corpora quadrigemina, and, while the mechanisms are doubtless analogous to that responsible for the light reflex in the pupil, the latter is not carried out by these fibres [see below, however].

A further word of explanation is probably necessary. From what has been said already the student of the subject will gather that the arciform fibres of the tectum are divisible into colliculonuclear, tectobulbar, and tectospinal sets, distinguishable, to some extent at least, by the levels at which they effect a decussation. It is possibly somewhat impracticable thus to differentiate three groups; at any rate, what has been called the colliculonuclear tract is included by some authorities in the tectobulbar system. Van Gehuchten,<sup>47</sup> for example, states that the tectobulbar fibres, in descending and crossing below the aqueduct to apply themselves to, though remaining distinct from, the posterior longitudinal bundle, give off collaterals to the cells of the third-nerve nucleus of both sides. Cajal,<sup>34</sup> on the other hand, believes that the connection between tectum and oculomotor nucleus is effected by his nucleus interstitialis, the origin, or one of the origins, of the posterior longitudinal fasciculus, collaterals from which, as is known, reach the third nerve centres. We are, in fact, thus brought back to the view of Edinger, that the possible paths by which the junction can be brought about are abundant enough. It matters little, as a fact, what name is given to the innermost set of arciform fibres as long as we recognize that directly, or by the 'fountain' decussation of Meynert or the dorsal decussation above the aqueduct, those of the fibres which are nearest to the aque-



duetal grey matter reach the homolateral and heterolateral oculomotor nuclei.

Perhaps the point may be made clearer from another aspect. The tectum opticum (optic lobes, region of the anterior corpora quadrigemina, superior or anterior colliculi, nates) is a reflex station of much significance and of wide relationships in connection with light impressions, as is the region of the posterior corpora quadrigemina in connection with auditory impressions. Taking only the former, it stands in anatomo-physiological affinity with homo- and heterolateral mesencephalo-ponto-bulbo-spinal centres for eye, face, head, neck, trunk, and limb movements in response to the stimulus of light. These are effected via descending crossed and uncrossed connections represented by various tectofugal fibre-systems. Of these, the suggestion here advanced is that the most anterior is that concerned with the reflex contraction of the pupil to light, the next anterior with movements of the eyeballs in response to light, and so on. For the moment, the physiological actuality of the most anterior connection is of more importance for our purpose than the nomenclature we adopt for what appears to be the anatomical path for the reflex, viz., the fibres from the superior colliculi which skirt the aqueductal grey matter above and below on their way to the third-nerve centres.

Our next problem is to determine where in the latter is situated the iridoconstrictor centre, a problem, unfortunately, which is just as vexed as the other we have been discussing. To quote Parsons<sup>36</sup> again: "The number of reflex pupillary centres which have been described and localized by various writers, each with the utmost assurance, is bewildering in the extreme".

The iris-constricting centre is usually taken to be located in the nucleus of Edinger-Westphal, a small-celled paired nucleus well to the anterior end of the oculomotor group and close to the mid-line. Edinger<sup>43</sup> himself believes from the cell-character of the nucleus (small, spindle-shaped or bipolar cells) that it is the visceromotor centre for the pręganglionic fibres which, by a relay in the ciliary ganglion, are connected to post-ganglionic fibres running in the short ciliary nerves to the sphincter iridis; Westphal,<sup>48</sup> finding the nucleus unchanged in a case of complete ophthalmoplegia externa, argued for its visceromotor nature by exclusion. Many objections, however, have been raised to this localization in the Edinger-Westphal nucleus of pupillomotor function: (1) According to Magitot<sup>49</sup> the pupils react to light by the end of the fifth month of foetal development, but at that stage the cells of the Edinger-Westphal nuclei are completely undifferentiated, not being recognizable till the seventh month; only the ventral part of the principal lateral nucleus of the oculomotor

constellation is then found to be recognizable. (2) Magitot further states that the nucleus is not seen in any other animals than man and the ape; in fact, in the latter animal small-cell groups are scattered here and there in the oculomotor nucleus and central grey matter generally, "sicher sind sie aber nicht zu einem eigentlichen 'Kern' vereinigt" (Monakow)<sup>50</sup>. (3) In several cases of fixity of the pupils to light, Majano<sup>51</sup> found no pathological changes in the Edinger-Westphal nucleus, while in another case it showed outfall of cells though the pupillary reactions were normal. Other observers have reported analogous cases. (4) Experiments by Bach<sup>52</sup> and by Biervliet,<sup>53</sup> and embryological researches by Tsuchida,<sup>54</sup> would appear to show that there is little specific localization either of individual external or internal muscles in definite parts of the oculomotor nucleus, but rather a diffuse or general localization. As far as the supply of the non-striped muscles of the eye is concerned, Monakow<sup>50</sup> concludes that their cells of origin are scattered mainly throughout the anterior (frontal) and mesial aspect of the principal lateral nuclei. Yet, if this were so, nuclear external ophthalmoplegias, the internal muscles unaffected, become more than ever difficult to explain.

Another by no means unattractive hypothesis may finally be mentioned. Is it possible that the light-reflex fibres from the superior colliculi, in the colliculofugal pathway already described, do not actually enter the oculomotor nuclei, but join the third-nerve trunks immediately below the nuclei and run with them to the ciliary ganglia, where they end in relation to post-ganglionic fibres to the iris? This is the contention supported by Majano<sup>51</sup> with much carefully investigated clinico-pathological and experimental material. He has adduced evidence which goes to show that the fasciculus longitudinalis prædorsalis, as it is sometimes termed—i.e., the tectobulbar tract, distinct from the posterior longitudinal bundle, arising from the lateral nucleus of the superior colliculus and crossing in part in Meynert's dorsal decussation—contains fibres which run, homolaterally and heterolaterally, into the third-nerve trunks directly, and so to the ciliary ganglia. In this fashion he simplifies the reflex arc considerably, reducing it to three components: (1) from retina to superior colliculus; (2) from colliculus to ciliary ganglion, a path which joins the oculomotor nerves but avoids their nuclei; (3) from ciliary ganglion to sphincter iridis. Uncertain though the matter is, evidence placing a pupilloconstrictor centre somewhere in the general oculomotor group is not to be lightly set aside.

It is known that the visceromotor fibres of the third nerve are distinct from the somatic-motor fibres, for in incomplete lesions of

the third nerve they may be intact when the latter are involved, and an old experiment of Schiff would appear to show that they are to be found to the inner sides of the oculomotor trunk.

Of the last stage in the reflex arc, from ciliary ganglion to iris, little need be said. There can be no doubt that this ganglion is the actual peripheral sympathetic ganglion for the sphincter iridis, though the short ciliary nerves differ from other post-ganglionic fibres in that they are myelinated, i.e., they are 'white' rami, and not 'grey'. Excitation of the ganglion produces myosis: and paralysis, mydriasis to an all but maximum degree.

#### THE PATH FOR CONVERGENCE AND ACCOMMODATION.

The negative element in the A.R. sign being the failure of the pupil to respond to light, the positive element is its contraction with the effort of accommodation.

Ordinarily speaking, accommodation is a willed movement and therefore of cortical origin; in the act, three muscles take part—the internal rectus, the ciliary muscle, and the sphincter iridis. Now the fundamental principle of cortical motor activity is that, in the cortex, movements and not muscles are represented. The movement of closing the fist is cortical, and the cortex, as it were, knows nothing of the muscles by which this movement is actually effected, viz., the three sets of flexors of fingers and thumb, extensors of the carpus, and triceps, respectively. There is trustworthy evidence which goes to show that the link between these groups takes place in the spinal cord. Similarly, the movement of lateral deviation of the eyes has its cortical centre at a known spot in front of the precentral gyrus, but the linking of homolateral internal rectus and heterolateral external rectus is effected at the pontine level by association between their respective nuclei. By analogy, we must hold that accommodation, as a movement, has a cortical centre, whereas the linking of the muscular components is peripheral, and is mediated by peripheral internuncial paths.

Of the actual site of this cortical centre we are ignorant, though, since the physiological centre for the oculorotary system (anatomically, the corticonuclear tract) is situated approximately at the junction of the second frontal and precentral gyri, a twin accommodation centre, for convergence instead of lateral deviation, may conceivably lie in the same vicinity, corresponding areas in the two hemispheres being physiologically associated. Be this as it may, the anatomical pathway known as the corticonuclear tract proceeds by the internal capsule near the genu to the crus cerebri, whence the nuclear fibres pass dorsally by the pes lemnisci profundus, through the fillet, to the nuclei of the extrinsic ocular muscles; and it is no unwarranted speculation

to suppose that by this tract also the impulse to effect accommodation in the triad of muscles already mentioned reaches their peripheral centre in the oculomotor nucleus, from which, as far as the intrinsic muscles are concerned, the path must lie via the ciliary ganglion.

It is immaterial for the purpose of this paper what is the exact relationship of the contraction of the iris to the ciliary-muscle and the internal-rectus contractions respectively; suffice it to say that in the former we have an associated movement rather than a reflex in the strict sense, and that if this 'synkinesis' is unusual in that it is a combination of somatic-motor and visceromotor elements the fact that the sphincter iridis is phylogenetically a striate muscle should not be forgotten.

From this necessarily brief account of the anatomo-physiology of accommodation, the point of importance for the A.R. pupil that emerges is that distal to the oculomotor nucleus the pathways for iris-contraction in response to light and in association with convergence-accommodation are identical. Lesions of the oculomotor trunk never cause reflex iridoplegia: no claims for the existence of separate (sympathetic) fasciculi in the oculomotor trunk for the two visceromotor functions will stand investigation, though this is the contention made to explain some of the local traumatic cases (see below).

#### SITE OF THE LESION UNDERLYING THE A.R. SIGN.

From the above descriptions it will be apparent that a unique or single localization for the A.R. sign is not to be expected, except that clinical, experimental, and pathological evidence combine to place the lesion on the afferent side of the light-reflex arc, i.e., anywhere up to the synapse of pupillomotor reflex fibres with pupilloconstrictor centre in the third-nerve nucleus, or its vicinity.

1. In my view, by far the most common localization is in the neighbourhood of the aqueduct, where colliculonuclear fibres may be caught before they enter the oculomotor nucleus, and from which accommodation-fibres are far removed. Fresh evidence has been advanced in this paper of the association of the A.R. phenomenon with tumours of the superior colliculi and third ventricle, and on these cases I desire to lay the greatest stress. They prove beyond cavil the possibility of the development of the sign from non-syphilitic processes of mesencephalic origin on the afferent side of the third nuclear group. This view receives strong support from the researches of Karplus and Kreidl, which in reality provide that *experimentum crucis* hitherto awaiting.

No originality whatever is claimed for this view, since it has been advanced many times before, but the support it receives from the tumour cases given in detail above is sufficient to place it beyond the



sphere of mere unverified hypothesis. Harris,<sup>46</sup> for example, in a closely argued paper, states that "although there is no positive evidence, I believe that the lesion of the Argyll Robertson pupil is a sclerosis of these fibres (fibres of Meynert's decussation), especially of their terminations in the neighbourhood of the third-nerve nuclei, a hypothesis which will account for all the phenomena of reflex iridoplegia".

There remains for some consideration the question of the frequency of the sign in neurosyphilis and its comparative rarity otherwise.

The neurologist is familiar with the peri-aqueductal degeneration often found in disseminated sclerosis: in fact, in that disease a subependymal sclerosis all round the ventricular system is common, and one of its possible explanations is a toxic lymphogenous invasion from an infected cerebrospinal fluid (though some have argued for a special vascular arrangement to explain this periventricular affection). Now in syphilis and other infective states an ependymitis or subependymitis is no uncommon condition—e.g., the granular ependymitis of parenchymatous neurosyphilis—and it appears to the writer a feasible speculation that there may be a special tendency for the syphilitic toxin to filter through to affect peri-aqueductal fibres, or terminal sensory arborizations, by lymphatic or possibly by vascular routes. A subependymal, peri-aqueductal, toxi-infective lymphatic spread will account for the frequency of the A.R. pupil in syphilis as readily as does a lymphogenous invasion via dorsal roots account for the absence of the knee-jerk. If it is asked why in such a postulated subependymal toxic spread the peri-aqueductal grey matter does not first suffer, one may legitimately point to the peculiar affinity of the syphilitic neurotoxin for afferent systems or for afferent terminal arborizations. In the search for a simple, uncomplicated, explanation of the *early* and *common* appearance of the A.R. pupil in neurosyphilis, at a time when the only other objective signs are likely to be toxic changes and evidence of meningeal reaction in the cerebrospinal fluid, I suggest that the theory now advanced, of an irregular spread of the toxin through subependymal tissues surrounding the aqueduct to susceptible afferent fibres or terminal dendrites, will be found more feasible than any other. The argument from the subependymal changes in disseminated sclerosis (peri-aqueductal, periventricular, under fourth ventricle floor, etc.) is topographically important though pathologically not to be stressed. By this theory the variations of the A.R. pupil in neurosyphilis—its uni- or bi-laterality, its absolute fixity or simple sluggishness, the presence or absence of consensual reflexes to light—can be readily understood. Jelliffe and White's<sup>15</sup> view that "chronic meningeal exudates" in syphilis press upon the pupillomotor fibres in the brachium or anterolateral border of the



superior colliculus is, I submit, incapable of explaining the early appearance of, and variations in, the A.R. phenomenon as satisfactorily as the one now offered. Moreover, the first changes in the reflex are being supposedly toxic, and not structural, one may in this way easily understand such observed facts as absolute A.R. pupils becoming relative, sluggish reactions becoming active, consensual reflexes returning, and so on.

2. In other and rarer cases, as we have seen, the site of the lesion is presumably nearer the back of the eye, in the course of the optic nerve or tract distal to the geniculate bodies. Axenfeld's unilateral traumatic cases can probably be elucidated on the supposition either that sufficient fibres were left to allow visual, but not pupillomotor, impulses to pass, or that there is a difference of vulnerability between thick and thin fibres. The observers of some of the other local (orbital) traumatic cases do not, however, thus explain the phenomenon. Abelsdorf,<sup>29</sup> for example, thinks a partial lesion of the third-nerve trunk in his case will account for the reflex iridoplegia; Ohm,<sup>27</sup> too, presupposes a double path in the nerve, one for the light-reflex and the other for the iris-reaction on convergence. These views are untenable, or at least unsupported by any pathological evidence. In cases of injury to the third-nerve trunk, Cushing<sup>55</sup> noted temporary paralysis of external muscles with intactness of internal muscles, but never a dissociated reflex in the latter.

3. Another theory assigns to lesions of the ciliary ganglion the phenomena of the A.R. pupil, a view urged notably by Marina,<sup>56</sup> and Lafon,<sup>57</sup> among others. Marina found degeneration and chromatolysis of cells in the ciliary ganglia in neurosyphilitic cases, and supposed the convergence-fibres run through the ganglion without interruption, only the light-reflex fibres being relayed. But the manifold objections to this theory far outweigh its possible attractiveness. The results of experimental paralysis of the ganglion (dilatation and complete immobility of the pupil for all stimuli) are utterly different from the clinical features of the A.R. sign: ganglionic lesions will not explain the myosis of many A.R. pupils, or the conservation of consensual reflexes in many instances; and not readily the absence of the dilatation-reflex following painful excitation. Pathologically, Thomas<sup>58</sup> found no degeneration in short ciliary nerves, ciliary ganglionic cells, or in proximal roots of the ciliary ganglion, in three cases of the A.R. phenomenon in tabes dorsalis. Lafon's attempt to override the manifest difficulties by supposing that syphilitic invasion of the ganglia causes 'perversion' and not 'paralysis' of function is, as it seems to me, almost a *petitio principii*.

In his Lumleian Lectures, Sir David Ferrier<sup>59</sup> has upheld the ciliary-ganglion theory nevertheless, although he apparently adopts it to

explain, not all cases of A.R. pupil, but only those of neurosyphilis. The endeavour is made to account for the dissociated reflex, not by Marina's view that the fibres for convergence-accommodation pass through the ganglion without interruption, but by supposing that "different nerve-fibres in the same trunk may be differently affected by destructive or toxic agencies"; the speculation is that syphilis may so affect the ciliary ganglion and ciliary nerves that though these "cannot transmit the reflex impulse of light to the sphincter pupillæ, they can readily allow the more powerful stimulus associated with accommodation to pass through". Why the assumption of a more powerful stimulus for accommodation should be made is not very clear, nor is the grave objection met that the theory fails to explain the preservation of the consensual light reflex in numerous A.R. cases. Besides, as already noted, the ciliary ganglion and short ciliaries have been found to be normal precisely in some cases of tabes with A.R. pupil—a serious blow to the theory.

It ought, perhaps, to be stated that changes in the ciliary ganglion in neurosyphilis are in no way excluded as an occasional or even a frequent occurrence, and with them the occasional or frequent irregularity of the syphilitic pupil may possibly be associated. But it must at the same time be pointed out that the argument (for the ciliary origin of the A.R. sign) which depends on a presumed association between pupil irregularity and the subsequent development of the A.R. phenomenon loses all force in view of the fact that a central (mesencephalic) origin for some pupil irregularities must be admitted<sup>14</sup> (cf. *Case 4* above).

#### THE MYOSIS OF MANY A.R. PUPILS.

Though in numerous instances the A.R. phenomenon is observed in pupils of normal dimensions, the fact remains that in some 30 per cent. according to Uhthoff (quoted by Lutz<sup>60</sup>), myosis accompanies it. Some of the proposed explanations of this concomitant myosis are rather vague. Higier,<sup>61</sup> for example, says that it is due to "absence of sensory stimuli owing to disease of the posterior columns of the cord"; Argyll Robertson<sup>1</sup> himself stated that "for contraction of the pupil under light it is necessary that the ciliospinal nerves remain intact, and as in these cases of myosis the ciliospinal nerves are paralyzed, light does not influence the pupil". But the spinal explanation of myosis, possible enough though it be in some instances, will not serve for all by any means, least of all for myosis accompanying the A.R. sign.

The myosis of the A.R. pupil cannot be due to irritation or excitation, for it may continue for years, and, further, is unaccompanied by any spasm of accommodation (not that the latter point always

signifies). Ferrier's<sup>59</sup> opinion that it is caused by "degenerative changes of an irritative character in the sphincter itself" is open the same objection; how irritation can be caused by degeneration in a minute muscle and continue indefinitely is difficult to conceive. The myosis must be the sequel, in large part at least, to paralysis of the pupillodilator mechanism, for which the descending sympathetic path to the so-called ciliospinal centre of Budge, thence via the superior cervical sympathetic ganglion to the carotid plexus, Gasserian ganglion, ophthalmic division, and long ciliary nerves to the iris, is well known. Some iridodilator fibres, however, probably pass from the carotid plexus to the sympathetic root of the ciliary ganglion and so possibly to the iris, for after gasserectomy the pupil never remains permanently contracted. A paralytic lesion of the descending pathway will occasion myosis without the A.R. phenomenon; for the combination, we must seek a solution at higher levels.

The descending iridodilator tract just described is known at the level of the medulla, where occluding lesions of the posterior inferior cerebellar artery cause softening of the lateral aspect of the medulla, one of the symptoms of which is homolateral myosis. Evidently, then, the pathway lies somewhere in the *formatio reticularis*—according to some, near the *fasciculus solitarius*. Higher up still, Spiller<sup>62</sup> has in two cases of pontine lesion found evidence of involvement of the tract in the shape of homolateral myosis, deducing therefrom absence of decussation below that level. Here, however, clinico-pathological evidence comes to an end, but, fortunately, at the same point experimental work comes to our assistance. At a spot on the base, lateral to the *infundibulum*, near the exit of the third nerve, and just behind the optic tract, Karplus and Kreidl<sup>63</sup> have in a series of twenty cats obtained with constancy, on electrical stimulation, a maximum dilatation of both pupils; and have shown by suitable procedures that this stimulus is definitely transmitted by the homolateral peduncle, and crosses in part at a lower level, to descend to the cervical cord and so back to the eye by the familiar route. Further research by the same observers points to the sympathetic centre for this iridodilator path being located in the *regio subthalamica*, dorsomesial to the *pes pedunculi*, in the frontal part of the *corpus Luysii*.

Though this experimental work requires verification, we might be able to explain the frequent combination of A.R. pupil and myosis on the assumption that the iridodilating tract on its way through the *mesencephalon* passes near Meynert's dorsal tegmental decussation or near the aqueduct, but this is at present purely speculative. Lutz's<sup>64</sup> hypothesis is that the descending fibres run in the tectospinal tract,

and that lesions of the tectobulbar tract cause the light immobility, and of the tectospinal tract the myosis. The suggestion is interesting, but equally speculative, though by exclusion it is easy to demonstrate that the myosis of some A.R. pupils cannot result from involvement of the third-nerve sector and must be the outcome of a more centrally situated lesion. The problem, simply stated, is: Where do the light-reflex arc and the pupillodilator path come sufficiently close to each other to be simultaneously implicated in a common destructive lesion? In the present state of our knowledge the question is more easily posed than answered.

There is reason to believe that the effect of the pupillodilator mechanism is double; i.e., the iridodilator centre of the mesencephalon (or wherever exactly it be) exercises, in functional activity, both a stimulating action on the iris via the spinal route and an inhibiting action on the iridoconstrictor centre of the third-nerve nucleus by another—direct—route to the latter. Should, then, the dilating mechanism be at fault, or interfered with, the pupil contracts doubly, as it were, because of the loss of this inhibiting influence on the tonus of the constrictor centre.

Another interpretation of the myosis of the A.R. pupil is nevertheless possible, since the constrictor tonus of the centre in the third-nerve group is modifiable from another direction.

It is known, and has been experimentally demonstrated,<sup>36</sup> that dilatation of the pupils can occur when the usual dilator tract is out of action; the explanation offered, also supported by experimental evidence, is that the tonus of the pupilloconstrictor centre in the oculomotor group can be directly inhibited from the cortex. Though the paths by which this inhibitory influence is exercised are unknown, there is a very definite anatomical connection between cortex and corpora quadrigemina in the form of the palliotectal system of fibres, which end in large measure in the superior colliculus. From thence the assumption is warrantable, in fact probable, that the physiological influence passes by peri-aqueductal lines to the iris-constricting centre in the oculomotor group. Assuming that among these are the fibres stimulation of which inhibits the tonus of the latter centre, causing dilatation, then we must, conversely, consider that paralysis of these same fibres removes this cortical inhibitory action, hence overaction of the third-nerve constrictor effects, and consequent myosis.

Now it will be at once apparent that this hypothesis fits in with the view which assigns to destructive lesions in the neighbourhood of the aqueduct the usual appearance of the A.R. phenomenon, so that in this fashion the frequent myosis may find a simple explanation. Not only so; by such a postulated mechanism the common observation that the A.R. pupil does not respond to painful or



emotional stimuli by dilatation can be readily understood. Such suitable excitations as should lead, by this 'psycho-reflex' mechanism, to inhibition of the tonus of the third constrictor centre or centres, and consequent dilatation, fail to reach the latter owing to the assumed interruption of functional activity between the pallio-tectal terminations in the superior colliculi and the oculomotor group.

Other matters connected with the subject must be left over. It is scarcely an exaggeration to say that few problems in organic neurology will so well repay further minute anatomical and physiological research as the A.R. phenomenon, which has been a *Haupttummelplatz* of controversy for the last fifty years.

#### ADDENDUM.

While this paper was in the press, two communications have appeared which have a bearing on our subject.

Frank<sup>61</sup> has adduced fresh pathological evidence to negative any connection of the Edinger-Westphal nucleus with the irido-constrictor mechanism; on the contrary, he considers his researches point to its being the mesencephalic centre for convergence, and with it he associates functionally the anterior median nucleus of the oculomotor group. As for the centre for iris-contraction to light, he thinks it may be found in the central grey matter dorsal to the nucleus of the fourth nerve, in the nucleus of Boettiger-Westphal, and with this he links the nucleus rapheos posterior, but the positive evidence brought forward in support of this localization is less impressive than the negative evidence in regard to the former.

Of equal interest is a paper by Schuster<sup>65</sup> on paralysis of vertical eye-movement. His second case is that of an old man of 62, with double A.R. pupil and paralysis of upward movement of the eyes, and with no other neurological sign. Post mortem a small softening was found in the mesencephalon, skirting the aqueduct on the right side, in the deeper layers of the tectum. The author promises us a fuller examination of the case: in the meantime the combination of A.R. pupil and paralysis of vertical movement, on which stress is laid above in tumour cases, is here exemplified by a vascular lesion in approximately the same area.

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## SOME ANALYTICAL INTERPRETATIONS.\*

BY MAURICE NICOLL, LONDON.

THE relationship of the unconscious to the object is a problem that belongs very intimately to modern psychopathology. Jung teaches that man has evolved gradually from a primitive relationship to the unconscious to a more differentiated one. Development can be conceived of as differentiation from the unconscious, the unconscious being the mother-paradise or psychological womb from which the personal differentiation must take place. When the psychology remains infantile, the acceptance of life is minimal. Some degree of infantile psychology is met with at all ages. The infantile psychology, that is, the undifferentiated psychology, causes continual resistances to arise in relationship to the object or objective task: and these resistances may appear in the form of illnesses or states of fatigue or actual neuroses. Whenever the libido has turned away from its normal destiny it remains relatively at the infantile level; also in so far as the libido has not found its normal destiny it remains at the infantile level. *When the psychology is in the infantile-primitive orientation it suffers the greatest compulsions and inhibitions from the unconscious.* This condition of affairs is to be observed in some degree amongst primitives, whose lives are subject to the greatest compulsions and inhibitions.

The unconscious is to be divided into the collective and the personal. The collective unconscious is the racial inheritance. The personal unconscious is produced during life through repression of personal experiences. The relationship to the collective unconscious can be formulated in the following way, which is chiefly based on Jung's teachings.

1. In the state of least differentiation the collective unconscious is seen, or realized, as if it lay outside, in the objective world. It is projected outwards. In the earliest or most primitive psychological state the collective unconscious is projected into the object. This orientation is seen in primitives, and to some extent in little children. It gives to the object—or the objective world—an unreal value. *The unconscious is in the object.* In this way the archetypal motives or

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myths belonging to the collective racial unconscious project themselves first into actual objects, which become invested with attributes that do not belong to them. When the unconscious is in the object, it gives to the object a mysterious value. Among primitives we see a mysterious value attributed to objects on all sides. To the primitive the world is full of magical significance. He is hedged about by extraordinary doubts. His approach to the object is far from simple. A stone that has a particular colour or shape, or lies in a certain way, becomes full of meaning. There is projected into it something that comes from the unconscious of the primitive himself, which does not really belong to the stone.

In this orientation the collective unconscious is identical with the object. What is really subjective is not detached from what is really objective. As long as this state persists there is *participation mystique* with the object. The object becomes endowed with demoniacal or God-like qualities, and is feared or worshipped accordingly. The whole world trembles with magic.

In the child we observe the remnants of this historical process. The child has always a considerable degree of *participation mystique* with the object. For it, the object is easily transformed into something which it really is not. *Participation mystique* gives rise to spells, incantations, and rituals which alone can deal with the unconscious admixture with the object. Through the magic of spells and charms the primitive seeks to influence the projected elements of his collective unconscious, that appear to him as qualities in the object.

This orientation gives an externalization of the collective unconscious. The archetypal motives thus go into objects and find expression in objective compulsions. At this stage man deals with the unconscious by *enchantment*.

2. The next stage in the psychological evolution of man, as regards his relationship to the collective unconscious, is when he begins to free himself from the projection of the unconscious into the object. As soon as he can discriminate between the objective and the subjective, the unconscious begins to be detached from the object. But where does the detached unconscious go? Formerly it went outwards and was identified with the object. It *animated* the object. When it begins to be set apart or stripped away from the object it must go somewhere. *Immediately the collective unconscious begins to be detached from the object, mythology arises.* Mythology is the content of the collective unconscious once it is detached from the object. Through mythology primitive man escapes partially from the projection of the collective unconscious into the object. We must understand mythology, historically, as a means whereby man set apart the content of the collective unconscious and came into a truer

relationship to the real object. By this means he first divided *the world of the psychological realities from the world of the objective realities*. At the same time a considerable mingling still remained. From an objective and concretistic expression of the collective unconscious in the object man passed, through the tremendous wealth of ancient mythologies, towards a more subjective and symbolical expression of its contents, and consequently could deal more adequately with the object. By this means he began to detach himself from the collective unconscious, gained greater freedom, and ultimately reached *science*.

If mythology arises through the stripping away of the projection of the collective unconscious into the object, it must contain the content of the collective unconscious. This would mean that mythology is primarily composed of the archetypal motives contained in the racial collective unconscious. Speaking of this conception of the collective or absolute unconscious, Jung states that it contains the "world-images in general under the form of primordial images or of mythical themes". The fact that myths have so much in common all the world over is to be explained partly from the basis of this conception. Immediately man, in any part of the world, begins to make a distinction between subject and object, and so detach the projections of his collective unconscious into the object, he *must make mythology*, because the detached collective unconscious must assume some form. Because the collective unconscious is the common inheritance of man, the mythologies that result will resemble one another. There is no doubt that the forms that the myths take vary greatly in their detail, and are influenced by migration. The themes, however, are more constant. It was this thought, arising in connection with the world-wide myth of the hero seeking re-birth, that led Jung to the idea of archetypal motives and so greatly extended Freud's conception of the unconscious.\*

I have said that at first the collective unconscious is identical with the object, and is later detached and becomes more subjective. This thought shows a possibility of more than one interpretation of the dream being valid. For example, the myth of the hero who is overcome by a monster in the West and is swallowed by it—if this image is taken outwards towards the object it means that the sun goes down in the evening into the mouth of the ocean. It therefore

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\*It seems that Freud now refers to inherited phylogenetic systems, and regards them as 'precipitates' of the history of human civilization. The child reaches after phylogenetic experience when individual experience fails it (*International Journal of Psycho-analysis*, 1920, i, Pt. 3, p. 311). It is difficult to understand how the conception of the collective unconscious can be kept out of such speculations. Jung's conception of the primordial images or archetypes, of the collective unconscious, and his theory of regression (as a replacing of the most recent function by an older form) were formulated a number of years ago.

becomes a nature myth. Much of mythology has been interpreted in terms of sun and nature myths. These interpretations were greatly overstrained and ultimately proved to be only partly effectual. If we give the dream a sexual-objective interpretation only, we are in like danger of straining the dream material too much in one direction. The image of the hero going into the monster, for example, can be said to be a symbol of incest. If we take the image in a more subjective way it means that the energy contained in consciousness disappears like the sun in the evening into the monster of the unconscious. From these considerations it would seem, therefore, that the dream material is capable of an objective and a subjective rendering. All psychological material coming from the unconscious is very delicate, and a rigid theory of interpretation is apt to inflict damage upon a system of explanation which may be capable of doing good service if not too violently handled.

The collective unconscious contains the attributes of God and devil as archetypes. By that we mean that the function of God and the function of the devil are real in a psychological sense in that they belong to the components of the collective or impersonal unconscious. When the collective unconscious is identical with the object, then it is natural that the object assumes divine or demoniacal properties. In the same way these functions may be projected into objects nowadays, and this is what may happen during the course of analysis when the personal unconscious is being drained and the collective unconscious approached. Then the reaction to reality may become greatly complicated by the projection of elements belonging to the impersonal unconscious. Unless these projections from the collective unconscious are detached from the actual object, and recognized as psychological realities, various complications will ensue. The analyst, for example, will become God or demon, and will either have all sorts of marvellous qualities or be capable of deeds of the greatest treachery and shame. *These collective psychological contents must be detached from the objects of consciousness and realized as psychological realities outside the individual psyche* (Jung). Otherwise there will be identification with the collective unconscious. Identity with it produces remarkable results. Either there is apparent an immense inferiority or a tremendous megalomania. If there is megalomania, then a little God of the world emerges and speaks the immense collective symbolism through a little mouth, and with tiny gestures indicates that all is finally settled and the last word spoken. By that road lies no ultimate solution.

I have now traced out briefly some of the ideas contained in Jung's more recent teachings. In the dream will be found *many archetypal constituents and themes apart from the personal ones*, and



explanation of such dreams upon purely personal grounds is not sufficient and may lead to the most stupid results. In this paper I cannot speak at any length of the relationship to the unconscious which is contained in the conception of the *anima* or soul. I will say here that immediately a relationship to the unconscious is obtained in the psychological development (and this begins whenever the unconscious is detached from the object and realized to be not in the object itself), a function is established, namely, the function of a relationship to the unconscious. This is what Jung calls the *anima*. The conception of the *anima* is very complicated and difficult, but we must not expect to find the study of the unconscious easy. In the case of a man, this function of relationship to the unconscious, through which a progress in the psychological development out of the primitive-infantile state is really possible, is represented in the dreams under definite but varied forms. One of the commonest representations is that of the woman. In analysis, where a relationship is being established to the unconscious, the dreams that refer to this function of relationship are very important; and if they are given an objective interpretation a valuable phase of the analytical work is missed, which leads later on to trouble with the transference. Transference to the unconscious is a matter of importance in our work. Dreams which deal with the transference are only taken objectively, in relationship to the analyst, by the Freudians. In the analytical work the patient begins to approach the unconscious, and he may have the greatest resistance to accepting the unconscious. With certain people the acceptance of the unconscious is very difficult. They cannot get to their subjectivity or to their introversion, but seek to explain everything away. In such cases we should look very carefully for the statement of the psychological situation in the dream. A transference to the analyst does not necessarily imply an acceptance of the analysis or the unconscious. The patient may get a certain kind of transference to the analyst and yet refuse to accept the unconscious.

To return to the question of the identification of the collective unconscious with the object—how does this practically affect us in analysis? This condition, as I have said, leads to *participation mystique* with the object. Now we find in neurotics a great deal of *participation mystique*. I propose to discuss shortly a dream arising in a patient who had agoraphobia; that is, a fear of open spaces. He could not cross Trafalgar Square without a violent attack of anxiety. Now this is *participation mystique* with Trafalgar Square. There is nothing actual in the objective situation that should give rise to the fear. There is obviously an admixture of some element with Trafalgar Square that renders the crossing of it impossible. This

element is a projection from his own unconscious. Because *participation mystique* is a condition belonging to a primitive-infantile orientation of the psychology and therefore to a lack of differentiation from the collective unconscious, we find ourselves dealing with the question of the infantile personality in dreams of patients. This infantile personality is really a question of relationship. An infantile-primitive relationship finds an expression in the dream in a symbolic form, as, for example, a little infant, or an animal. I must state here that I am taking the view that the myth of man is contained in the collective unconscious, and that the treatment of the neurotic is a developmental matter. The push away from the collective unconscious, away from the archetypal Mother-Paradise into differentiation, is something that belongs to the collective unconscious itself. I will quote a legend from the Musquakie Indians bearing on this point. Their mythical origin is accounted for in the following terms. They are descended from a Great Mother called Henauee. She lived "on an island green and fertile, with berries ready ripened for their use, trees with acorns to make bread and sweet white roots easy to dig up". She gave birth to two sons, who grew to manhood in a few hours, received some instruction from their mother, built a boat, and at sundown paddled over to the mainland, leaving her behind, "because she, the pleasant of speech and beautiful of face, looked from her eyes so terribly that they, the unfearing, sweated with fear".\* This is the Genesis myth in another form. The impulse that drives men out of the collective paradisaal mother-unconscious into personal differentiation is shown here in the form of a myth. The mother suddenly becomes terrible—that is, the 'incest' barrier appears—and fear begins. I doubt whether the Freudian interpretation of fear and anxiety on a concretely sexual basis is wholly true. Fear is connected with being turned out of the womb of the collective unconscious. The going into the collective unconscious is one aspect of incest. The regressive desire to go back to the collective unconscious—into non-differentiation—gives rise to fear also. From this standpoint fear has much to do with the evolutionary process inherent in the human psychology. These two men who are turned out of Paradise by the mother becoming terrible reach the mainland, and they look back and see the island of the mother sinking below the waves. This is a mythological expression for the fact that the archetypal unconscious sinks into the depths as soon as personal differentiation begins. The heroes have now to face the world and overcome the mother as a projection

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\* *Folk Lore of Musquakie Indians*. By Mary Owen. 1902 : Folk Lore Society.

into the world. That libido that strives back towards the mother-unconscious is the libido that gives an infantile-primitive relationship to the unconscious. It is the backward look of these two heroes, and it meets the look from the eyes of the mother which is so terrible.\* Anxiety is therefore connected with this libido. This libido also keeps up a primitive relationship to the object, because its existence means an omphalic bond in some part of the psychology, so that there is still *participation mystique*. In such a case we would expect to find in the dream, in so far as we regard it as a subliminal picture of the actual situation, references to this libido and also to its necessary fate.

The patient in question, whose dreams I am about to quote, was a young man, married, with one child. He had suffered from agoraphobia from the age of about fifteen. He began the analysis with the following dream. He sees people firing at one another (face to face) and the bullets bounding off their heads. The dream is repeated in more than one way. He sees one man firing at another and the bullets bounding off the head. He sees someone firing at him and the bullets bound off his head. Such dreams mean very strong resistances, and suggest a problem of 'narcissism'. When the analyst comes upon such a preliminary statement of the subliminal psychological situation he must not expect to advance very quickly. This is later followed by a second dream in which somebody is trying to steal the dreamer's little child, and he resents it violently. Later on he dreams that he is with his wife in a bathroom, and he is cutting his little girl in two, "with a view to doing her good". We now come to the main dream which I wish to discuss.

"I remember saying good-bye to my wife, as I was going back to hospital. On arriving it is all very much larger. The matron comes, asks me how I am, and shows me up to a room. I got into a bed with a very small fireplace on the left-hand side, in which a small coal fire was burning. The matron comes in with a man who is supposed to be a doctor, and my father, and a girl of about fifteen. The doctor and my father sit down on the left of my bed. The matron did not stay, but looked at me in a knowing way. The doctor said, 'Fetch me your child'. I got out of the bed and went to the end of the room where my little girl was. The girl of fifteen was treating the child in a careless way. I spoke to her sharply. The child was very small and wet, and smelt. I could not hold it up, but round its feet was a plated sort of ring which I slipped up until it came up to the shoulders. I then had it the right way up and brought it to the doctor, who immediately took a pocket knife and cut it deep into the head in order to give it air. He then handed it to my father, who dragged the knife about, saying perhaps it had not reached the tonsils. I then noticed that

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\*This matter is dealt with in Jung's chapter on the Dual Mother Rôle, in his *Psychology of the Unconscious*.

the child had turned into a pheasant, and that there was a large hole in its throat, and that it was dying. I then went up to a basin, which was smothered in blood. I sponged my mouth and took out a collection of bones which had stuck in my throat, like the corpse of a small bird. My mouth was full of blood. I woke up in a terrible state of anxiety and covered with sweat."

The intensity of feeling in the dream is often a guide to the resistances. The more reluctant the attitude is towards accepting anything, the more intense and powerful will the dream tend to be. The principle of compensation is at work here. This dream deals with the drama round the fate of the infantile personality. We see plenty of indications that could give this dream a castration significance. From the Freudian angle we could say that the theme concerns the fear of castration by the father, and that the doctor is identified with the father, and therefore the transference to the doctor is complicated by the father identification. Objectively the patient had a concrete problem with his father in actual life. The phrase "supposed to be a doctor" indicates the resistance to the analyst. The head is a phallic symbol, and the tonsils can easily be connected with the testicles.

I will now regard these dreams from the point of view of symbolism. In our work we take the manifest content as a matter of great importance, in that it gives the guiding line for the meaning of the dream. The latent content must be fitted into the manifest content so that the real meaning of the dream is reached. The Freudians take as a guiding principle the discovery of a wish-fulfilment.\* I think I could say with a fair degree of accuracy that in our work we take the manifest content as a general guiding principle to the underlying significance of the dream. I will now take up the original line of argument concerning the theme of the sacrifice of the infantile-primitive personality. This infantile personality is here shown as the little child.

The hospital is the place of cure. He leaves his wife and moves towards the place of cure. If he must leave his wife in order to go to the place of cure it is necessary in the analysis to examine very carefully his relationship to his wife. We must remember that marriage had not cured him of his phobia. He associates with the hospital a place where he was not happy, where he was one of a crowd and was treated very impersonally. This he resented. His infantile psychology demanded special attention and special consideration. The impersonal

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\* Freud appears to be modifying the original form of his wish-fulfilment theory of dreams; and ascribes, to the core of the unconscious, a kind of instinctual knowledge. But at the same time he denies any prospective significance to unconscious products. The phylogenetic constituents of the unconscious are presumably of no prospective significance from his standpoint.



machinery of the hospital upset him. An association which he made with the girl of fifteen comes in here. He said, "I overheard her describing her experience with me to somebody else. She was laughing at me". He had attempted to have a sexual relationship, but failed. From the girl he got no special consideration, and his infantile personality was wounded. She was not the mother to him, but the stranger-woman, the challenger and taunter. The first person met in the hospital is the matron. She takes him in charge and leads him to the place where the operation is to be performed. Concerning her he made the following associations. "She was strict. I don't think she was interested in me." We have then here a picture of the mother, the matron, in her impersonal aspect, in the aspect of discipline, who leads the patient to his fate. I must refer here to the quotation which I have made from the mythology of the Indians. The two heroes suddenly found the mother turned against them. This is the mother in the terrible aspect, or the archetypal or impersonal unconscious in the aspect of all that the 'incest-barrier' means. The larger size of the hospital may have some connect on here. He moves in the direction of the collective unconscious and finds, not the peace of the infantile Nirvana, but the motive of sacrifice and reality coming from it, and fear and suffering. In the hospital ward there is a small fire burning on his left. In his associations he said that a nursery guard protected the fire. The smallness of the fire and the surrounding of it by the infantile protection are symbols of an undeveloped relationship. If after the destruction of the infantile personality in the dream the fire were found to be burning more brightly and the nursery guard to be gone, it would illustrate the problem of the dynamics of energy that I suggest here. However, there is no further reference to the fire at the end of the dream, but there is reference to a great outpouring of blood.

Now the patient cannot hold the child save by a peculiar ring that is round its feet. The associations to this ring are as follows: "It was square, a sort of square washer. I have seen this used in connection with the springs of motor cars. Its function is to keep something in place. I could only hold the child by means of this ring, which I slipped up until it was under the armpits". The ring is therefore something which enables the patient to get hold of the infantile personality—something which the infantile personality has upon it to enable a contact to be made. It is of metal. It led him to associations connected with an inventive, but little developed, creative side of himself, and to mechanics. This side is, therefore, of importance to him, for it enables him to take the first step in dealing with his problem. It assists the dreamer in getting a grip of this slippery customer in himself which is symbolized by the dirty child.



The wetness of the child takes the dreamer to bed-wetting. He remembers that he used to wet his bed when he was little, a habit which he kept up for some time. Bed-wetting is certainly an infantile mode of behaviour. The question of urine comes in here, and the genetic significance of urinary symbols. The connection between urethral erotism and power is recognized. Power psychology is in some way often connected with urinary symbolism in the unconscious. We have to consider the significance of urination symbolically. I can find no reason why the act of urination in the dream, or the sexual act itself, should always be arbitrarily taken as a finality. The urinary stream passes out into the world of objects. Urination thus can become a symbol of the libido passing outwards into reality. I might speak of a 'urinary' relationship to the object, a urinary relationship to the object being characteristic of a peculiar, urgent, non-humorous, power-ambition psychology, in my experience. The patient in question had a pronounced power-relationship, of an infantile character, to the object: and therefore, correspondingly, an enormous resistance to the subjective relationship to the unconscious. The symbolisms of in front or behind are not really always sexual in meaning. They may deal with the relationship to the world of objects and the relationship to the world of the unconscious. In a sense the unconscious lies behind us, the world of objects lies in front of us. The symbols of urination and defaecation are sometimes used in these and many other applications. In connection with urination and power we have to remember that the child has often many fantasies with regard to the urinary stream, about its direction, about the height it can go and the area it can cover. These become associated with the idea of the putting out of one's own personality into life as an expression of power over the object. The custom of certain primitive tribes in handing on the power to a new-coming medicine man must be mentioned here. The retiring Shamam passes urine over the new-comer, thereby handing on his power. The frequency of micturition that often comes when people are in a very ambitious, excited, and restless state of mind must also be considered. I will take the reference in the dream to the infantile personality being dirty and wet with urine as being connected with the theme of the infantile power-relationship to the object, developed later to a 'blood' relationship.

The operation is then performed upon the child through the head: first, the head is cut open in order to let in the air. Now in the first dream which I quoted in connection with this patient the bullets were bounding off the heads of the dream figures. Resistance lies in the head therefore. His stubbornness lies in the conscious attitude. I do not think we need only see in this a phallic meaning. The doctor in the dream, and the father, appear to deal with this resistance,

in that they cut through the head to "let in the air"—that is, to admit of a freer relationship. The infantile personality thus begins to be sacrificed, and at the same time it changes into a pheasant. That is, it changes from something human but infantile into something more primitive. It retrogrades—that is, it moves towards death, with an accompanying *release* of blood. When anything diminishes or dies in the dream, we always look for what is growing or coming to life. Libido is indestructible. With regard to the pheasant he gave the following associations: "A pheasant likes stubble. It is impossible to rear pheasants save near hedges or cover of some kind. I have never seen a pheasant on the open ice or in a place in which there is no cover. A pheasant will run down a rabbit-hole to take cover rather than rise in the air". The patient thus links up the pheasant with the idea of his own phobia. He himself is afraid of the open, and cannot endure any place where there is no cover. If we take the dream reductively as a castration motive, the changing of the child into the pheasant is obscure.

This transformation of the libido into a more primitive form through the operation—into a form in which a connection is made with the actual phobia—proceeds even further. The final stage of the dream is that the carcase of the bird is in the throat of the dreamer and that he plucks it out with much loss of blood. The blood is the libido set free by the process. With a narcissistic psychology, there is always a problem of how to release the 'blood'.

Mythologically the dream can be compared with certain symbols pervading religion. The symbol of Mithra slaying the bull can be taken. In this symbol, the bull (the infantile-primitive personality) is killed by the god, and from its released blood spring the fruits of the earth. The transformation of the libido from one orientation to another is here shown. From the sacrifice of the primitive indolent incest-libido that moves backwards towards the archaic mother-unconscious, and that seeks to keep the psychology undifferentiated, the symbols of the world are created. The Christian symbol was more effective, and therefore had the supremacy as a more complete expression of the unconscious motive, because the whole personality is sacrificed—but in both cases with suffering and reluctance. In the case of this dream, an archetypal theme finds expression in the operation on the infant, its retrograde devolution towards the animal form, its death, and the subsequent release of blood. I suggest that *this release means, prospectively, what the released blood means which pours out of the wound in Mithra's bull, and becomes transformed into wheat*. It is a mythological parallel, occurring in a young man unacquainted in the conscious with such ideas. It will be understood that the dream, viewed from this angle, becomes a product of extra-

ordinary significance, and cannot be confined under the formulation of Freud as a disguised infantile-erotic wish-fulfilment.

We must now briefly consider the significance of the father, to whom the infantile personality has to be handed over, and who completes the destruction of it. This means submission to the 'father': the infantile personality must submit to the father-principle. The infantile personality does not accept life, but always seeks a special consideration. People who have an infantile psychology do not accept life *as it lies potentially in them*. That is the broadest formulation. The thing that they will not submit to—the thing that they will not accept—becomes the father. For a man the father is biologically the opponent, as long as the man has not developed his own strength, his own father in himself. Every neglect of the normal biological development of man leads to an inferiority which may find a representation in the dream as a conflict with the father. The father becomes the projection of his own missing father-strength, which lies latent in the unconscious. We have to get patients in analysis to accept life and its tasks, to accept marriage and to accept parenthood, through realizing that these motives are found in the unconscious. Unless analysis changes the attitudes to life it is useless. They will find the authority for these steps in themselves; that is the most important thing in the analytical work, arising out of our view of the unconscious as a compensatory principle. The finding of the authority in oneself makes the approach to life quite new. The realization of the necessity lying in oneself, and not having been invented by a certain old man, or by a tribal god, or by anything that has descended in the form of commands upon tables of stone—all this makes life intensely different and individual, and gives to the neurotic one of the most valuable revelations that he can possibly have. He then gets a transference to the unconscious. When the patient in question who had the above dream realized that these forces were in himself and these symbols for the treatment of his life problem sprang out of his own psychology, he was startled. His defences were attacked from within—a grave discovery to many—particularly the narcissist.

I have given a slight outline of the significance of this apparent castration dream from the standpoint of an archetypal motive. I have outlined the significance of this archetypal theme under the aspect of an internal necessity for the sacrifice of the infantile personality, and suggested that the neurosis was due to the clinging to an infantile-primitive attitude which the unconscious sought to overthrow.

To sum up: The movement towards the archetypal unconscious is shown in the dream under symbols which suggest the mother. To

take such a movement as always meaning incest in relationship to the actual mother is limited. Such an interpretation does not admit of a deeper meaning of the motive. Under all sorts of circumstances the dreamer moves towards the archetypal or collective unconscious. In this paper I have given a movement towards the mother-unconscious in terms of the hospital and the matron. There the dreamer experienced the drama of the sacrifice of the infantile personality. That is what he gets from the archetypal unconscious. We have no question of real incest here.

The kernel-complex, found in all neurotics, is said by Freudians to be the incest-wish. We give that a different expression. The kernel-complex is not only a question of the objective mother and the patient's relationship to her. It is also a question of the archaic or collective unconscious and the inner relationship to it. I have outlined briefly how in the most primitive state of psychology the collective unconscious is identical with the object, and how later a differentiation begins whereby the contents of the collective unconscious are detached from the object. This gives rise to mythology, and to the beginning of a relationship to the unconscious on one side and to the world of reality on the other side. We have seen mythology give place to religion. When the religion corresponds to the symbols in the collective unconscious, then we get the best relationship possible to the collective unconscious through the religious symbols. The influence of the collective unconscious seems to change by a slow rhythm, and in time the old religious symbols no longer give an adequate relation to it. Then man's relationship to the collective unconscious becomes difficult. We are in such a state now. We live in an age of rationalism—of what I might term scientific narcissism—and we have no relationship to the collective unconscious. We have no mythology, and we have little religion. We have in place the beginning of analysis. Analysis is perhaps really necessary in order that man may re-establish a relationship with the collective unconscious.

## Critical Review.

### THE WISH AND THE AUTONOMIC SYSTEM.

BY ALFRED CARVER, BIRMINGHAM.

"The structure of psycho-analysis that we have erected is really only a superstructure, which at some future time must be placed upon its organic foundation."—*S. Freud*.<sup>1</sup>

TIME was when academic or arm-chair psychology held undisputed sway. It was purely intellectualistic, but like everything else duly served its purpose; now, like Marley, it is "dead as a door-nail". Perhaps, like Marley's ghost, it will come back in modified form at some future appropriate time.

Its place was taken by experimental or laboratory psychology, which under the auspices of Wundt had a brilliant reign. This reaction-time psychology, however, savoured too much of a refined physiology of the special senses, and by its very methods deliberately strove to eliminate the element of affectivity from the field of investigation. Its most noteworthy achievement was the establishment of sensation as the unit of psychological process. More recently the gap which rendered this phase of psychology devoid of pragmatic interest has, in many instances, been bridged: notably for example by Jung<sup>2</sup> in his word-association studies.

A reaction against intellectualistic and laboratory psychology came with the behaviourist school, which seeks by objective inquiry to arrive at an explanation of human as well as of animal behaviour. The behaviourist is content to pose the question, What is the organism doing? on the assumption that the observable facts will furnish a complete explanation of conduct. Ultimately this is doubtless true, but many pitfalls exist in the application of the method, and it is difficult to be sure that we are not mistaking accident for essence, or confusing part-action with the whole. In order that the answer to the question be complete, it should explain not only what the organism is doing but why the organism is doing it. The outstanding fault of behaviourists is that they have failed to take consciousness into account. The apotheosis of consciousness has certainly been harmful; yet such extreme reaction from it only involves us in other difficulties.



Then came Freud, who, while neglecting nothing that had preceded him, drew attention to the incomplete nature of all questions which previously had been posed. His attitude was, and is, one of eternal interrogation. Far from being satisfied with intellectualistic or laboratory methods, or even with asking, What is the organism doing? he demanded further, Why is the organism doing it, and why doing this instead of an infinity of other apparent possibilities? Before this fearless onslaught the older psychologists and psychiatrists drew back amazed, for Freud refused to be deterred when the answers to his never-ceasing questions were of a nature disagreeable to established conventions or prejudiced hypotheses. Being a man of genius, he paid attention to the infinitely little, to the next-to-nothing, and maintained in the face of all opposition that every slightest lapsus must have its meaning. Such a practical psychopathology of every-day life proved most unacceptable to self-satisfied authorities; yet it has triumphed, for Freud persisted until he established the 'wish' as the unit of psychological process in place of the old unit of sensation, which is merely a content of consciousness. Of this doctrine of the wish E. B. Holt says, "It is the first key which psychology has ever had which fitted, and moreover I believe it is the only one that psychology will ever need"<sup>3</sup>. Certainly the doctrine of the wish has given to psychology a causal category which previously was lacking.

As with so many of Freud's terms, exception has been taken to the word, and psychologists have attempted to improve upon it by substituting such expressions as 'conative tendency' or 'dynamic trend', etc. To all of which Freud would, I think, reply, "A rose by any other name would smell as sweet, provided only that you have no repressions with regard to it".

The 'wish' may be simply defined as a course of action which the organism is prepared to take with regard to some situation or object in its environment. Ever since the days of Darwin, biologists and physiologists have recognized that even reflex action is purposeful, i.e., reveals a wish. Sherrington in particular has laid stress on this fact, and has made use of it in his experiments; thus he says, "To glimpse at the aim of a reflex is to gain hints for further experiments on it"<sup>4</sup>. But to study isolated reflexes is to pick the organism to pieces, and this, though desirable in physiology, is inadmissible in psychology, for by so doing we destroy precisely that which we set out to study. We may well ask why, if the wish or purpose in action is so obvious, was it not more readily recognized, and why did Freud's doctrine meet with ridicule and determined opposition? The answer would seem to be that for its complete understanding another factor, the unconscious, must be

reckoned with. The omission of this factor obscured the struggle which takes place between asynergic purposes. Now wishes conflict when they would lead the organism to opposed lines of conduct, and in such cases one of the wishes is liable to be repressed. Yet, though now unconscious, it nevertheless continues to exercise an influence upon conduct. The intellectualists had overlooked the unconscious, while behaviourists had ignored consciousness; hence neither were in a position to understand the capital rôle of the wish in determining conduct. Of course, where conscious and unconscious wishes reinforce one another no difficulty arises: but when, as is so frequently the case, the two are opposed, behaviour becomes complicated and difficult of interpretation. For its explanation we require to know all the wishes of which it is the resultant overt expression.

In order to discover the unconscious wishes influencing behaviour, Freud developed his psycho-analytic technique. With the many theoretical conclusions at which various workers with this technique have arrived it is not my purpose to deal. Freud himself has always been more interested in mental mechanisms than in the mere interpretation of behaviour or symptoms; yet he has nowhere attempted to explain the physiology of the wish. He has used rather vaguely a concept of psychic energy without in any way seeking to define it.

Alfred Adler,<sup>5, 6</sup> one of Freud's earliest followers, who subsequently seceded from the group, does make an attempt to correlate psychological and physiological data by assuming that abnormalities in conduct arise as compensatory reactions against organ inferiority. But this, although it contains a nucleus of truth, proves a one-sided and incomplete hypothesis.

More recently Edward Kempf<sup>7-12</sup> has sought to demonstrate the physiological basis of the wish, and the purpose of this article is concerned mainly with his very stimulating conclusions. Kempf maintains that the wish may be completely accounted for if it is recognized as none other than a localized autonomie-affective craving, which compels the organism to such behaviour as shall satisfy the craving. Thus the source of the wish is peripheral: it is to be discovered in the autonomie system. Before entering into the detailed application of Kempf's hypothesis, it will be well to outline his conception of the autonomie system and its servant the projicient, or cerebrospinal system. The autonomie or vegetative apparatus is the more primitive of the two. It consists of all the viscera, with the nerves which innervate them, whether the latter belong to the sympathetic or parasympathetic division; also the autonomie neurones of the cord and cerebellum (proprioceptive

system), which maintain posture in striped muscles (sarcoplasmic element<sup>13</sup>). The cerebrospinal nervous system proper and the striped muscles (sarcoctylic element<sup>14</sup>) constitute what Kempf terms the projicient apparatus. According to Kempf, this more recently developed apparatus must be regarded as having been evolved as a mechanism for securing the gratification of the primitive autonomic cravings.

Without the latter apparatus the satisfaction or neutralizing of a craving, e.g., hunger, would be very largely a matter of chance. The function of the projicient apparatus is to acquire for the receptors the craved-for stimulus, and conversely, where the craving is of a negative or avertive nature, to remove the receptors from the noxious stimulus. It thus brings the organism into intimate relationship with its environment.

Since there is a continual though varying stream of affective impulses from all parts of the autonomic apparatus, the organism must be constantly adjusting itself. Most of the time this affective stream is subliminally active, and adjustment is brought about reflexly; but if the tension of any segment is greatly increased, the organism becomes aware of the craving and seeks to adjust to it overtly as a unity, by acquiring such stimuli as have the capacity to relieve or neutralize it. To illustrate Kempf's views by a simple example such as hunger: Cannon and Carlson<sup>15</sup> have shown that definite gastric contractions are concomitant with the gnawing craving arising in connection with the organic need. This may be described as a hypertonic posture in an autonomic segment. It cannot be reflexly adjusted, and therefore causes awareness of the need in the organism, which now seeks to neutralize it by the acquisition of a suitable stimulus, namely food. In this simple instance we see the peripheral origin of the wish in an autonomic segment and its neutralization by means of the projicient apparatus. But Cannon and Carlson have further shown that when a painful stimulus excites either a contact or distance receptor, the stomach assumes a hypertonic posture, and that its secretions are held in abeyance. This state of affairs is concomitant with a feeling of fear or anxiety, and persists until the avertive craving has been neutralized by the projicient apparatus, which may either destroy the stimulus by fight or place the organism beyond the range of action of the stimulus by flight. From this it will be obvious that Kempf is a firm adherent of the James-Lange theory of emotions; he indeed goes much further, and declares boldly that "in a certain sense we think with our muscles". Hence both thought and emotion are peripheral in origin, and the cerebrospinal or central nervous system has no other function than the integration of the

various peripherally-arising wishes, so that a maximum of affective gratification may accrue to the organism as a unity.

This brings us to a consideration of the nature of consciousness. No branch of neurology has been able to demonstrate that any nerve centre within or without the brain has anything like the functional capacity that could entitle it to be looked upon as a centre of consciousness. On the other hand, every living cell has the capacity to react to certain stimuli with such qualities in the reaction as may be regarded as a manifestation of awareness. "Hence it is necessary to recognize that the nervous system has only the capacity of integrating the activities of the peripheral organs".

Consciousness in the ordinary sense of the word occurs when the body as a unity must adjust itself to the special or dominating activity of one of its parts.<sup>16</sup> The content of consciousness depends then upon the activity of our receptors, and the justification for the dictum "We think with our muscles" is that the kinæsthetic impulses arising from the proprioceptive field are much more numerous than those from all other receptors.

The essential basis of an efficient personality, as of a business, or society, is the organization of its constituent parts into an integrated unity, so that each part-need or craving is satisfied without jeopardizing the interests of the whole. In proportion as integration is incomplete there is inco-ordination, and part-cravings conflict for control of the final common motor path irrespective of the interests of the organism as a unity. When any one segment thus succeeds in making the organism as a whole subservient to it, the organism becomes mal-adjusted, or ill. We have now to consider the more important factors which may determine this outcome of the striving among various autonomic segments. It is well recognized that in lowly organisms instinctive response to stimuli is relatively fixed, but that, as we ascend the evolutionary scale, response becomes increasingly plastic, so that one and the same stimulus may evoke differing types of behaviour.<sup>17</sup> Also a stimulus, which primarily was indifferent in so far as a particular reflex or instinctive action is concerned, may later come to call forth the response. The researches of Pawlow,<sup>18</sup> Bechterew,<sup>19</sup> and others<sup>20</sup> have shown conclusively that this is due to "conditioning".

There is no need to enter into the experimental proof of conditioning, but it is of capital importance for the understanding of behaviour. It is in the conditioning of the segmental cravings to react to associated stimuli that the individual comes to develop characteristic traits. These constitute the very foundation of character formation, and determine vitally important preferences



and aversions throughout life. Conditioning proceeds unconsciously from earliest infancy, and thus is responsible for 'fixations' in Freud's sense of the word. Fixations once established are a most important factor in giving rise to conflict and repression.

This leads us to the subject of repression, and in his treatment of this lies the crux of Kempf's hypothesis. The conflict of the various autonomic cravings seeking to obtain neutralizing stimuli causes heightened visceral tensions and postural tonicities. The egoistic unity cannot attack segmental cravings directly, but attempts to keep any perversely conditioned craving from consciousness by controlling the final common motor path of the projicient apparatus. If this attempt is only partially successful, the segment, though not able to dominate the projicient apparatus completely, yet does so sufficiently to cause the organism to be conscious of its need—this constitutes suppression. When, however, the attempt meets with complete success, the ego represses the segment to such an extent that it cannot even cause consciousness of its need—this constitutes repression proper. The craving being now unable to acquire neutralizing stimuli, the visceral tonicity persists, and "the repressed affect seems to be stored like the energy of a compressed spring in the heightened postural tension of some division of the autonomic apparatus".<sup>21</sup> Hence repression "merely walls in the wishes, but does not disintegrate them", and the repressed affects which are bound up in the postural tensions incessantly trying to force the organism to become conscious of their needs and seizing upon the slightest opportunity for gratification, cause uneasiness. The repression, however, is maintained by a vigorous co-ordination of the rest of the autonomic apparatus (which acting as a unity constitutes the ego) upon a substituted or compromised line of behaviour, thereby continually preventing the intolerable perverse craving from causing awareness of its need and jeopardizing the status of the whole organism.

According to Kempf, then, affective reactions are to be regarded as resulting from these autonomic postural tensions, and emotion is the result of cravings which, being suppressed or repressed, are unable to release the tensions by acquiring neutralizing stimuli. Kempf discusses, from this point of view, some of the major emotions.<sup>22</sup> For example, he considers that the various manifestations of fear are all due to some kind of noxious stimulus, and exist as heightened postural tensions as long as the organism fails to protect itself by removing the receptor from the stimulus. "If a means could be devised wherein a local anæsthetic could prevent the spasmodic adjustment of the diaphragm and viscera from producing feelings of fear, the animal would not flee or feel any fear."<sup>23</sup>



Anger in all its varieties tends to remove the noxious stimulus from the receptor, and to continue to do so until the stimulus is sufficiently altered as to be harmless. When this is brought about, the uncomfortable tensions cease and the organism is appeased. "Self-protective anger may be aroused by the discomfort resulting from affective cravings failing to acquire necessary stimuli. This additional aggressive component may then make the acquisition possible by overcoming the resistance." This corresponds to the thesis I put forward that the goal of emotion is to enhance interest.<sup>24</sup> Disgust seems to include elements of fear and anger reactions, and is caused by the gastro-intestinal defensive-emissive movements. Disgust, though primarily gastro-intestinal, comes, by conditioning, to be applied to other stimuli.

Thus the affective stream arises peripherally from the receptors in the autonomic apparatus. The thought content of consciousness is largely determined by the nature of this stream as it affects the postural tonus of the striped muscles, and the projicient apparatus may be regarded, in a sense, as the thinking apparatus of the body trying to acquire means to please the affect. This corresponds to Holt's dictum that the wish is a course of action which some mechanism of the body is set to carry out, and that thought is latent course of action (motor setting) with regard to environment.<sup>25</sup> But Kempf goes further in assuming that the motor sets are compelled by the affective autonomic stream seeking so to dispose of the receptors as to avoid noxious stimuli, or acquire stimuli which will re-establish a comfortable postural tonus.

Kempf is such a whole-hearted supporter of the James-Lange theory of emotions, and credits the cerebrospinal nervous system with such entirely subservient functions, that even granting the phylogenetic priority of the autonomic system, he overlooks the fact that later-developed structures and functions supersede and dominate the more primitive. In a conflict of instincts, for example, it is usually the more primitive which succumbs. It is well recognized, as I have pointed out elsewhere, that the more highly developed the central nervous system in any species, the greater and more numerous are its emotional responses. Yet as a more highly developed projicient apparatus should enable the organism more effectively to acquire neutralizing stimuli, one would expect higher animals, especially man, to be relatively free from emotions. As the converse is true, it would seem that we cannot ignore the rôle of the higher nervous centres in the genesis of emotional reactions. Since the organism is a unity, we might expect emotions, no matter what their origin, to suffuse it, and not be confined to manifestations in one part. The function of the so-called physical concomitants

of emotion clearly seems to be to help the organism in the motor activity to which the emotion would lead it.<sup>26, 27</sup> According to Kempf, however, the cerebrospinal system is compelled by the so-called physical concomitants both to feel and to act.

Other questions which arise are as to whether the distinction which is generally drawn between affect or interest and emotion is valid or artificial, and whether the simple sensations which arise in connection with organic needs such as micturition and hunger can legitimately be classified with emotions. Hunger, which Kempf cites as a critical instance because its mechanism has been fairly fully worked out by Cannon and others, is generally regarded as a specific appetite tendency. That is to say, it is recognized as depending upon a state of the body, is accompanied by uneasiness, and is periodic in its operation. Notoriously the pangs of hunger pass off if gratification is long deferred, whereas an essential point in Kempf's hypothesis is that the affect or emotion is stored up in an indefatigable postural tension. Are we to consider the emotions, which arise in connection with the instinctive processes, as in essence nothing other than conditioned appetitive tendencies? Should further research justify such a view, we shall have to consider Kempf's hypothesis as, in the main, proved.

It is interesting to note that although Kempf is in general a firm believer, not only in the value of psycho-analytic technique, but also in most of the conclusions which Freud has deduced from its use, his belief in the peripheral origin of emotions renders Freud's conception of the conversion of the energy of the repressed wish into physical symptoms unintelligible to him;<sup>28</sup> while to Freud "what psychology has to say about emotions—the James-Lange theory for instance—is absolutely incomprehensible".<sup>29</sup> In such an impasse a *via media* must be sought. Not only has Freud not overlooked the constitutional basis of behaviour and psychic deviation, but on the contrary he has frequently drawn attention to it. If Kempf did not claim so all-dominating a rôle for the autonomic segments, but were to allow to their slave the projicient apparatus some influence upon the feelings and conduct of the organism other than the mere securing of gratification to its masters, such a way might be found.

Kempf agrees with Freud that the basal conflict in the psychoneuroses takes place between the egoistic and libidinous impulses. He states explicitly that "only those individuals are biologically well adjusted whose sexual affections are so conditioned that, in their striving for gratification, they reinforce the ego's struggle for social esteem."<sup>30</sup> He has paid more detailed attention to the development of the egoistic tendencies than Freud hitherto has

done, and considers that the individual's craving for social esteem is the most persistently active of all the compensatory autonomic functions. This is due to the fact that from infancy to old age he is conditioned to obtain his needs by methods which are approved or sanctioned by the herd. If, however, the herd imposes too severe restrictions, adaptation becomes correspondingly difficult. The same forces that, when harmoniously integrated, build up a personality, cause, when unadjustable conflict occurs, its deterioration; and Kempf, as a result of his observations, gives us a mechanistic classification of neuroses and psychoses based upon the psychopaths' affective difficulties and their attitude towards these.<sup>31</sup> This classification is a great advance upon any previous systems, which have all been founded on a static conception of neurology. It may be adopted without necessarily accepting Kempf's fundamental hypothesis, for it holds good no matter what the origin of the intolerable wish.

Kempf's work is of so all-embracing a nature that space only permits of the outlining of his more important conclusions, and it is impossible here to take up the far-reaching applications which it has to the problems of education, social laws, and religion, or to what he terms "the struggle for virility, goodness, and happiness". In essence the whole problem is one of conditioning of the various autonomic-affective cravings. Yet we must see to it that social conditions are not too restrictive, and remember that moral laws are only moral in so far as they promote the progress (virility, goodness, and happiness) of society, for as Bacon said, "We cannot rule Nature except by obeying her".

The essence of Kempf's thesis is the translation of the wish—established by Freud as the unit of psychological process—into terms of indefatigable visceral tonus and postural tensions compelled by autonomic-affective cravings. True, the importance to psychology of the autonomic and endocrine system has until recently been but little appreciated; but whether we are so to reverse matters as to ascribe to this system the absolutely dominating rôle which Kempf would have us do, must depend upon further researches.

In any case the painstaking work of Kempf, which is based upon a personal study of over two thousand psychopathic and criminal personalities of many nationalities and intellectual levels, constitutes a distinct contribution to psychopathology, and merits very careful consideration. It is a commendable attempt to explain the organic physiological foundation of the wish, and certainly provides a practical and monistic conception of personality.

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## Editorial.

### THE ORGANIC ASPECT OF SHELL SHOCK.

DURING the war, popular interest in 'shell shock', and the emotional tone which invested the question, made unbiassed inquiry difficult. This popular interest in the problem has now largely disappeared, and it is possible that the War Office Committee which is at present sitting may be able to discover sources of information which were not available during the epidemic of war speculations. Valuable aid might be sought from those who dealt with the cases in the front area itself. Unfortunately, the conditions there—the stress of work, and the many conflicting duties of the front line—made systematic investigation almost impossible, and it is doubtful whether any considerable amount of accurate information is now available.

A case of 'shell shock' as seen in a home hospital has little in common with the case observed a few minutes after the explosion which gave rise to it. In cases of true 'shell shock' the early condition is an organic one; the later condition seems rather to be due to a neurosis which supervenes upon the original state, especially perhaps in those where early treatment has been improper. That the early case of true 'shell shock' may undoubtedly exhibit an emotional state is recognized by all, but underlying it there are certainly signs of organic lesion. These signs are transient, but clearly marked, and it is perhaps their fleeting character which led many to accept the view that the tremendous forces of an exploding shell usually gave rise to disturbances of a purely 'functional' character only. Inequality of the pupils, vertigo, inco-ordination of possibly cerebellar origin, impairment of the tendon reflexes, and even the presence of an extensor plantar reflex, may be noted; the cerebrospinal fluid may exhibit raised pressure, increase of its cellular and chemical constituents, and the presence in it of red blood-corpuscles. To these may be added organic signs like those which are associated with hyperthyroidism—exophthalmos, von Graefe's sign, dilatation of the pupils, and increased frequency of the heart-beat. Even in cases where a nervous breakdown occurred as the result of an explosion not near enough to concussion the soldier, these latter organic signs were almost invariably present. It is a common statement that such a nervous



breakdown is due to the emotional 'mental' reaction to the explosion. To say this, however, is to put the cart before the horse. Every one who has experienced an unexpected explosion in his near vicinity knows that the shock effect occurs before he has time to be aware of the nature of its cause. He starts and shakes before he has time to orient himself to the explosion. It is far more likely that the emotional 'psychic' state which follows an explosion is due to the antecedent organic reaction of the nervous system than that the organic state—that which gives signs like those associated with hyperthyroidism—arises after the soldier has pondered over the nearness of his contact with death.

The real problem of shell shock is to seek a means of curing this early neurological state before it is allowed to become crystallized, for insistence upon the 'mental' cause of the condition by those who had no experience of its early stages largely obscured the necessity for neurological investigation during the war.

The soldier, with his true knowledge of the actual conditions, was prejudiced by the manner in which the problem was treated at home. He knew that in some cases men do break down in the line from hardship and from horror; he knew that such a breakdown was sometimes anticipated by the soldier as a means of escape from the line; he knew that in other cases the result was due to actual explosion. The unfortunate and inaccurate use of the term 'shell shock' tended to a grouping of all these cases in one class, and the soldier was inclined to give the whole class the character of its worst component.

Few have much respect for a fellow man who leaves his comrades in the lurch, and the undoubted leniency with which we treated these cases during the war made the 'common-sense' soldier fear that the morale of his troops might suffer if what he considered to be an amateurish mode of treatment was allowed too much scope among the fighting battalions. He was, however, misled in making this sweeping generalization. We may postulate that the 'shell shock' of concussion falls more or less indiscriminately in its incidence, and that the breakdown due to an explosion which does not concussion often affects the best material. It is our hope that the War Office Committee will discover a method of curing the neurological state which is certainly the prime factor in the former class, and probably also in the latter, and of preventing the late neurosis which so often supervenes. A proper knowledge of the etiology and nature of the primary state, and a consideration of the treatment given in civil life to cases of cerebral concussion, would no doubt aid them, and it is to be hoped that the possible analogy of the two conditions has not been lost sight of. To those familiar with the great insistence rightly placed on

absolute rest and quiet in civil cases, the haphazard treatment of shell concussion during the war appears an incredible folly.

There is one other organic aspect of 'shell shock' which we venture to commend to the Committee's attention. A common type of nervous breakdown commenced gradually, and reached its climax after or during a period of stress. Such patients lost their memory for details, and their interest in life; they became inefficient soldiers, and were sometimes reduced in their rank or relieved from their command. Sometimes they recovered after a short period of rest, to break down again at a later period. A point which we would like to emphasize is that not infrequently among such cases were found those which displayed an almost unnoticeable sluggishness of their pupils in reaction to light, slight inequality of the tendon reflexes, and a positive Wassermann reaction. Cure in such instances is more likely to be permanent if vigorous antisyphilitic treatment is given in place of psychological treatment.

Cases of this nature offer an interesting field of inquiry. It may be suspected that early cerebrospinal syphilis is a disease which may appear and again disappear almost spontaneously. The very slight early symptoms—often exclusively 'mental'—do not of themselves suggest the nature of the condition. Their spontaneous disappearance in the state of rest and quiet which accompanies the psychological treatment of shell shock may suggest that the treatment has effected a cure. It is of importance to know whether any considerable number of 'shell shock' cases have subsequently developed organic nervous conditions of syphilitic origin; and when any case with a similar history is claimed as having been cured by psychological means, the cure cannot be allowed in a strictly scientific sense unless the Wassermann reaction has been shown to be negative.

Indeed, we can hardly suggest a more important point to the War Office Committee than the necessity for a complete serological examination of the cerebrospinal fluid in all cases of breakdown, whether due to concussion, shell fright, or to a more gradual result of war stress. Especially as regards the last of these would we emphasize the importance of bearing in mind the great incidence of syphilis in the male population; the attested fact that parenchymatous and interstitial syphilis of the nervous system often develops with extreme rapidity after stress, accident, or concussion; and the possibility that milder forms of these conditions appearing in the circumstances of war may spontaneously resolve.

## Abstracts.

### Neurology.

#### NEUROPATHOLOGY.

- [1] Pathology of juvenile Tay-Sachs disease.—DIDE, GUIRAUD, and MICHEL. *L'Encéphale*, 1920, xv, 303.

THE following is a résumé of the alterations in the nervous system in a case diagnosed as hereditary cerebellar ataxy with retinitis pigmentosa, but found to correspond with the juvenile type of amaurotic family idiocy.

*A.—The Nerve-cell.*—1. Marked distention of the cell-body and of its processes; spherical or ovoid outline; displacement of nucleus towards the apical extremity of the cell.

2. The cell-body is filled with granules, some powdery, some coarse, staining blue with Nile-blue and yellowish-red with Sudan; sections stained with silver show a fine honeycomb-like network, which is quite distinct from the neurofibrillary network. The rest of the cell-body preserves its normal structure as demonstrated by Nissl's method, and the neurofibrils appear normal with Bielschowsky's stain.

*B.—Neuroglia.*—Proliferation, especially in the region of the swollen neurons. The cytoplasm of the neuroglia cells contains yellowish granules.

*C.—Vessels.*—The lining cells of the capillaries are often laden with granules stained red with Sudan; similar granules are found in dementia præcox, chronic chorea, and senile dementia.

#### REGIONAL CHANGES :—

1. *Cerebrum.*—All the cells without exception show the above changes, the Betz cells particularly. The frontal lobes are most affected.

2. *Cerebellum.*—Purkinje cells are very much altered, and many have disappeared altogether.

3. *Cord.*—Similar changes in the cells, the nerve-fibres remaining intact.

4. *Retina.*—(a) Infiltration of the different layers with pigmented cells derived from the choroid. The infiltrated zone extends as far as the ganglion-cell layer, but never reaches the nerve-fibre layer. (b) Disappearance of many of the ganglion cells; those remaining are grouped in fives and sixes.

The nature of the granules is of considerable interest; from their chemical and staining reactions they appear to be of the nature of phosphatides or cerebrosides, derived probably from breakdown of complex lipo-proteins of the interfibrillary cytoplasm. The swelling of the cell is due to the hydrophilic action of phosphatides and cerebrosides within

it. The lipid material in the capillaries is evidence of the fate of the products of degeneration, as is the presence of pigment granules in the neuroglia cells.

E. O'FLYNN.

- [2] Diffuse tumours of the ventricular walls (embryonic neuroblastomata) (Les tumeurs diffuses des parois ventriculaires—neuroblastomes embryonnaires).—E. C. CHRISTIN and F. NAVILLE. *Arch. Suisses Neurol. et Psychiat.*, 1920, vii, 49.

THE case described is that of a woman of 54, who for one year had suffered from headaches, and attacks of vertigo and vomiting. Her sight had failed, and she had had occasional periods of diplopia and of tinnitus. She had, in spite of these symptoms, continued her ordinary work until ten days before admission to hospital, when she suddenly developed double facial paralysis and dysarthria. Her previous symptoms at the same time became more acute, and she became progressively weak in her limbs. On admission her sight was poor, but she could count fingers at three yards, and see the hands of a watch at a foot; the fundus oculi was normal in both eyes, and the pupils reacted well. There was complete paralysis of the left, and incomplete of the right, internal rectus muscle, and complete paralysis of both external recti. Upward and downward movements of the eyeballs were retained. There was facial paralysis on both sides, greater on the left, without any fibrillation of the facial muscles. The Wassermann reaction in the blood was weakly positive. Lumbar puncture gave a fluid containing 26 cells per c.mm. and 0.2 per cent albumin. The patient became gradually weaker, and was for the most part in a state of low delirium; she died less than two months after admission to hospital.

At the autopsy the arachnoid was noticed to be somewhat thickened over cerebellum, medulla, and pons, and the oculomotor nerves where they entered the bony foramina were surrounded with an oedematous cone derived from this membrane. On section of the brain the walls of the ventricles and the iter of Sylvius were seen to be lined by a thick, soft, reddish-grey membrane, pieces of which had broken off and floated in the ventricular fluid. In thickness it varied from 3 to 10 mm., and covered the walls of the whole of the ventricular system, with the exception of the tips of the descending horns of the lateral ventricles. The left lateral ventricle was dilated; the right lateral ventricle was incompletely, and the third and fourth ventricles were completely, filled with tumour. On the floor of the fourth ventricle was a rounded tumour mass of the size of a small cherry which protruded slightly into the iter of Sylvius. This neoplastic lining not only protruded into the ventricles, but in some places, as over the caudate nucleus and optic thalamus, and on the outer surface of the left posterior horn, invaded the brain tissue to a small distance. The choroid plexuses were normal, and were not adherent to the tumour.

The microscopic appearances of the tumour were those of a glioma, formed of small round cells and larger multinucleated cells, with a fine fibrillar ground substance, and in addition there were many larger cells with a clear vesicular nucleus, closely resembling pyramidal nerve-cells. Numerous mitotic figures were seen, a rare finding in gliomata. The



ependyma lining the ventricles could only be seen in a few places, where it lay superficial to the tumour. In many places the adventitial spaces of the vessels, as they ran into the brain tissue, were infiltrated with tumour-cells. The authors consider the tumour to be a neuroblastoma, containing cells both of glial- and nerve-cell types, both in rudimentary forms. They comment on the rarity of diffuse tumours lining the walls of the ventricles, of which they have only found six cases in the literature.

J. G. GREENFIELD.

- [3] **Subacute leuco-encephalitis** (Leuco-encéphalite subaiguë à foyers successifs).—H. CLAUDE and J. LHERMITTE. *L'Encéphale*, 1920, xv, 89.

THE authors describe under the name 'subacute leuco-encephalitis' a pathological condition hitherto unrecognized, characterized by inflammatory foci in the centrum ovale, invading the basal ganglia to some extent, but leaving the cortex altogether intact.

The case is that of a young soldier of 19, who, after a slight fever, began in August, 1915, to have progressive weakness of his legs, which increased until, in October, he was unable to stand up. At this time he was also found to have inco-ordination and dysidiadochokinesis of the upper limbs. The deep reflexes were absent, and the plantar reflexes flexor. The cerebro-spinal fluid was normal, and remained so throughout. After slight improvement he got rapidly worse, and in December, 1915, he became bedridden, stuporose, and incontinent, with contractures of all the limbs. Thereafter he improved considerably, so that by February, 1916, he could walk. In April he again had a rise of temperature, and again lost the use of his limbs. He also became very dysarthric in speech. Again improvement set in, and by May he could walk with some support. In June his vision became affected, he was very inco-ordinate in his movements, and showed a considerable degree of apraxia, especially with the left hand. The deep reflexes were now increased, with Babinski's sign on both sides. No papilloedema was found. In October he developed ideas of persecution and auditory hallucinations, but could still walk with help. At this period he showed no motor or sensory aphasia, but had gross apraxia in the left hand. There was, however, no inco-ordination in the movement of either hand. In January, 1917, he became again stuporose, taking no heed of his surroundings, but in answering questions he gave no evidence of disorientation. He died on Jan. 10, 1917.

At the autopsy the only pathological changes, apart from some fatty degeneration of the liver, were found in the centrum ovale and basal ganglia of the brain. These were congested, especially in their posterior part, but showed no hemorrhages or areas of softening. Microscopically the greatest degree of abnormality was found in the white matter of the centrum ovale, corpus callosum, and internal capsule. The lenticular and caudate nuclei showed similar though less severe changes, and the optic thalamus was slightly affected. The rest of the brain, including the whole of the cortex and brain stem, was absolutely normal. The changes in the centrum ovale consisted of great dilatation of vessels, some of which were



thrombosed while others had small hæmorrhages surrounding them. Their perivascular sheaths were filled with small cells of lymphocyte type. There were numerous patches of myelin destruction, with corresponding damage to the axis cylinders, and in some of these there was very intense overgrowth of neuroglial tissue, giving rise to many giant forms of glial cells.

The authors draw attention to the obviously inflammatory nature of these changes, and deduce from them, and the clinical history of remissions, that the disease was due to some microbial agent. But as they were unable to undertake any injections into animals, the etiology is for the present purely conjectural.

J. G. GREENFIELD.

- [4] Pathology of a case of lipodystrophia progressiva.—F. PARKES WEBER and T. H. GUNWARDENE. *Brit. Jour. Child. Dis.*, 1919, xvi, 200.

THE authors claim that this is the first case of lipodystrophia progressiva followed to autopsy. The patient, a girl of 13 years, died as a result of a prolonged septicæmia which caused considerable emaciation in the parts of the body unaffected by the disease. In spite of this, a moderate amount of fat was present in the gluteal regions, orbits, omentum, about the kidneys, heart, and pericardium, and under the serous membranes. There was no evidence of tuberculosis. The thyroid gland was enlarged and very rich in colloid material. The thymus gland was very scanty. No other special abnormality was found in the endocrine glands, though the suprarenal cortex was considered to contain less lipoid than usual. Microscopic examination of a piece of anterior abdominal wall and of scalp from the occipital region showed complete or almost complete absence of fat-cells in the subcutaneous tissue. There was no evidence of inflammatory fibrosis. Little importance is to be attached to any of these changes, as the excess of colloid in the thyroid gland was less than often occurs at puberty, and changes in the suprarenal might be due to the prolonged infection.

J. G. GREENFIELD.

- [5] A clinical study of Wassermann-fast syphilis, with special reference to prognosis and treatment.—JOHN H. STOKES and GEORGE J. BUSMAN. *Amer. Jour. Med. Sci.*, 1920, clx, 658.

THE patients studied, in number 101, were cases of resistant infection which had still a persistently positive Wassermann reaction after more than twelve intravenous injections of arsphenamine and interval mereurialization. The average dosage was fourteen intravenous injections and ninety injections with mercury. Of the whole number, only 4 had come to notice because of definite secondary syphilitic lesions; the rest were Wassermann-positive cases with latent skin, visceral, and osseous manifestations. The tests consisted in the use of single Noguchi antigen with rabbit-human hæmolytic system, with active serum and incubator fixation. This conservative method the writers calculated would give certain positives with the multiple antigen and cold-fixation modifications, so that negatives would be detected with greater certainty by the method used than by the others.

An analysis of the persistently positive cases gave the following: Cardiovascular syphilis, 44 per cent; neurosyphilis, 30 per cent; osseous lesions, 30 per cent; visceral lesions, 21 per cent; other types, 10 to 17 per cent. Of the neurosyphilites, 40 per cent were cases of paresis and 50 per cent of tabes. Fifty per cent of the neurosyphilites had also cardiovascular syphilis. Patients with cutaneous syphilis showed the familiar immunity from neurosyphilis, and vice versa.

There was no evidence that a Wassermann-fast condition resulted from infection with any special strain of spirochæte; in fact, the multiplicity of the involvement pointed rather in the opposite direction.

Of these resistant cases, 84 per cent have undergone symptomatic arrest to-day as a result of treatment. The cases of paresis and tabes with gastric crises account for more than half of the failures.

In the discussion on treatment the writers urge that, while it is desirable that the positive Wassermann be reversed, this object should not be the primary object of the therapy. Symptomatic arrest within the bounds of tolerance is the most important point. As regards prognosis, a persistently positive serum Wassermann test seems to accompany a grave, rather than a trivial, syphilis. The cardiovascular and nervous systems should be most carefully examined in all Wassermann-fast cases.

J. LE F. B.

- [6] Results of blood and spinal-fluid examination in syphilitic diseases of the brain and cord (Ergebnisse der Blut- und Spinalflüssigkeitsuntersuchung bei huetischen Hirn- und Rückenmarkserkrankungen).—H. KRÜGER. *Monats. f. Psychiat. u. Neurol.*, 1920, xlviii, 18.

THIS article is based on the systematic examination of 310 cases of general paralysis and of taboparesis, 84 cases of tabes, and 72 cases of cerebro-spinal syphilis. In each case the 'four reactions' were investigated, viz., the Wassermann test in the blood, and, in the fluid, the Wassermann test, the cell-count, and the globulin test.

*General Paralysis and Taboparesis.*—In 90 per cent of the 310 cases all four reactions were positive, and in no single one of them were all the reactions simultaneously negative. Only in 1 case was a pleocytosis wanting, and only in 3 was the globulin test negative. In 15 cases of the series the Wassermann test was negative in the fluid. Incompleteness of the four tests is suggestive either of an early stage of general paralysis, or of some interference as the result of treatment with salvarsan, although it is possible that these two factors may not explain every case where one or other of the four tests is negative.

*Tabes.*—In the tabetic series all four reactions were positive in about 70 per cent of the cases, and all four were negative in 3½ per cent. The Wassermann reaction in the blood was positive in 85 per cent, and in the fluid in 77 per cent. In about 10 per cent no pleocytosis was found, and in a slightly smaller percentage no increase of globulin. The explanation of the negativity of all four reactions in a few cases is to be assigned either to an early stage of the disease or to the result of treatment by salvarsan.

*Cerebrospinal Syphilis.*—In roughly one-half of the cases of the author's series all four reactions were positive: in two-thirds of the cases the Wassermann reaction was positive in the blood, and in about 80 per cent the positive Wassermann test in the blood, the pleocytosis, and the positive globulin reaction occurred in a quite independent way. There can be no doubt that in this group the result of salvarsan treatment in reducing the positive states of the tests is much more marked than in either of the two former groups.

A more difficult point to determine is whether, from the tests, general paralysis and tabes on the one hand can be separated from meningitic, gummatous, or vascular neurosyphilis on the other. From the author's figures it is clear that the tests are not of much assistance in this respect, except in so far as the conclusion is justified that, if the reactions improve rapidly under salvarsan treatment, the condition is likely to be one of cerebrospinal syphilis. In tabes, and still more in general paralysis, the pathological state of which the tests are the expression proves much more refractory even to persistent treatment.

S. A. K. W.

### SENSORIMOTOR NEUROLOGY.

[7] **Contralateral plantar reflex.**—ALFRED GORDON. *Jour. Nerv. and Ment. Dis.*, 1920, lii, 482.

IN well-established hemiplegia the crossed plantar response is usually bilaterally flexor, though it may be extensor in a few cases. In cases of myelitis and transient intermittent paralysis there may be no plantar reflex obtainable on the parietic side, but the crossed reflex may be extensor, showing that serious change may take place in the pyramidal system and be confirmed by the subsequent development of paralysis. To produce the crossed reflex the stimulus must be strong, whether applied by the methods of Babinski, Oppenheim, or Gordon.

R. G. GORDON.

[8] **A spinal sign in gastric crises in tabes.**—W. BROWNING. *Med. Record*, 1920, xcvi, 728.

THE author describes a sign which he claims has not been noted previously, and which consists of a small point of tenderness just to the left of the spinal column, corresponding to the 5th dorsal interspace, or about that level. It is always found on the same side as the stomach, and may be an area covering more than one space. The tips of the thumbs or fingers are stroked across the areas in question, and a positive sign is elicited if the patient winces or complains of discomfort. The sign persists for a few days before and after a gastric attack, and in the intervals the tenderness subsides. The origin of gastric crises is shortly discussed, the author suggesting that "the 'central' (cerebral) origin heretofore largely assumed" is unlikely to be the true origin of the attacks. The above statement is unexpected, as since the days of Charcot the spinal origin of lightning pains and other 'crises' has held the field to the exclusion of all others in medical opinion. Treatment by counter-irritation over the hyperalgesic

area is recommended, with internal administration of a powder containing  $\frac{1}{100}$  gr. each of calomel, brucia, and powdered ipecacuanha. The author evidently writes from a small clinical experience of gastric crises in tabes.

J. LE F. B.

[9] **Acute epidemic encephalitis.**—CHARLES H. MINER and STANLEY L. FREEMAN, *Amer. Jour. Med. Sci.*, 1921, clxi, 91.

TWENTY cases are analyzed. The following symptoms and signs are noted :—

*Prodromata.*—In 18 of the cases seen during the first week of the illness catarrhal symptoms were observed, especially of the nose, like those associated with influenza; there were also pains, headache, frequently vomiting and constipation. These lasted three to seven days. The incubation period was not determined, as no two cases occurred in the same family. In two instances the onset was sudden, with delirium, and in one there was lethargy. Headache was present in all cases, and vomiting in 8. The pyrexia average was seven days. The age incidence was 9 to 78 years; sexes affected, 12 male to 8 female.

*Cranial nerves.*—In 17 cases diplopia occurred, lasting two to four days. The various nerves were affected as follows: the third nerve in 18 cases, the fifth in 9, sixth in 6, ninth in 7, and the eleventh in 3 cases. The facial was frequently involved, and always more on the right side.

*Symptoms.*—Apathy or coma was striking, lethargy lasting two weeks to three months. Delirium was observed in 17 cases, catatonia in 16, ataxia of intentional type in 18, choreiform movements in 11; muscular fibrillation was noted in every case to be a striking feature, often local, but occasionally general in distribution. Tremor, coarse and of intentional type, was also constantly observed. Parkinson's mask was present in all but one of the cases. An eruption was found in 3 cases, in 2 herpetic and in 1 purpuric. Paralysis in the arms and legs was noted in 5 cases, in all of which there was polyneuritis. Euphoria was present in all the cases except those with polyneuritis. All were asthenic. The reflexes showed no constant departure from the normal, and in none was a Babinski's sign obtained. The cerebrospinal fluid showed no change from the normal in its reactions to the various tests, including the Wassermann reaction. Of the 20 cases, 3 died, 1 patient is still very ill at the time of writing, 15 are better, and 1 is quite well.

J. LE F. B.

[10] **The epidemic of lethargic encephalitis.**—ISADOR ABRAHAMSON, *Med. Record*, 1920, xeviii, 969.

THIS short article briefly records the history of the disease and attempts to correlate recently described syndromes with the epidemics described by Jean de Troyes, Ambrose Paré, Sydenham, etc., in the past. Some recent pathological and bacteriological researches are mentioned, particularly those of Bassoe, von Wiesner, McIntosh, Ayer, and Wegeforth. Von Wiesner's success in transmitting the disease to monkeys from fatal human cases is quoted as placing beyond reasonable doubt the communicability of



encephalitis. Cleland and Campbell's work in Australia with the glycerinated virus, and their success in conveying the disease to five monkeys, and thence through fourteen generations from monkey to monkey, thence from monkey to sheep, horse, and calf, and finally from sheep back to monkey, are all duly summarized. Work by Loewe, Hirschfeld, and Strauss on a filter-passing virus obtained from the nasal washings of fatal cases, and their successful cultivating of small globoid bodies, are quoted as positive evidence of an infective agent, though it is admitted that Flexner and Amoss were unable to confirm these findings.

The questions of carriers, susceptibility, etc., are raised on a broad basis of epidemiology. It is suggested that the infective agents of influenza, poliomyelitis, and encephalitis may spring from a common protozoon stock, though the writer does not attempt to justify his speculation by evidence in its support.

J. LE F. B.

- [11] Epidemic encephalitis, including a review of 115 American cases. ARTHUR D. DUNN and FRANCIS W. HEAGEN. *Amer. Jour. Med. Sci.*, 1920, clx, 568.

FIFTEEN personally observed cases of encephalitis, and an analysis of one hundred cases from the American literature, form the basis of this paper. With regard to etiology, the writers suggest that the globoid bodies (Flexner's filter-passers in poliomyelitis), or the Rosenow streptococcus with globoid bodies, might be considered as streptococcal varieties. From one of their own patients, who at the time was suffering from influenzal bronchopneumonia and developing encephalitis with lethargy and diplopia, the writers were able to cultivate a green streptococcus from the blood. This organism agglutinated with the serum of the patient only, and remained unaltered when other sera were used. The patient's serum did not agglutinate the ordinary laboratory strains of diplococci and streptococci. Unfortunately the culture died out before any animal experiments were tried, and could not be replaced.

Among the special symptoms paresis of the third and sixth nerves was frequent. The third nerve was affected in 63 cases out of 115, and the sixth in 39 cases out of the same number.

The trigeminal showed signs in only 9 cases, and its motor division was rarely involved. Facial palsy, often unilateral in distribution, occurred in 15 cases. There was rapid respiration in 3 cases, one of which presented a respiration-rate of 60 per minute for thirty-six hours. In one of the three the patient had attacks of rapid breathing up to 80 or 100 per minute, but here the tachypnoea seemed to be due to myoclonic movements of the diaphragm. Lethargy occurred in 79 of the 115 cases. Out of the 15 personal cases, catalepsy and catatonia were noted in 6 patients and in 20 of the 100 from the literature, while headache formed a prominent symptom in 54. The authors draw attention to the fact that rigidity, or rather increase in muscle tone, is common in the disease, though it ought not to be confused with the more marked rigidity of meningitis where Kernig's and Brudzinski's signs are usually obtainable.



Tremor was noticed in 35 cases, coarse and not of the intention type; muscle twitching was a feature in 2 of the 15 personal cases. Changes in the reflexes were inconstant: 18 cases had a transient Babinski's sign, and Oppenheim's reflex was elicited in 5 of the 15 cases seen personally by the authors. Peripheral pain was present in 26 of the 115 patients, but the writers suggest that it is a commoner symptom than appears from these figures, as in their own 15 cases there was a definite neuritic pain complaint in 6. In 6 patients of the writers' 15 there was increased sweating amounting to night sweats, a fact of interest when compared with the 'sweating sickness' of former times. Pyrexia was transient, but present in all except 50 cases. A leucocyte count was made in 36, with an average result of 10,000 per c.mm., and of these 72 per cent were polymorphonuclears. Blood cultures were negative except in 1 of the 15 personal cases. The cerebrospinal fluid was always clear, but under increased pressure in 7 of the 15. Mononuclears averaged 9 per c.mm. The globulin test (Nonne Apelt) showed an increase in 4 cases. All the Wassermann tests were negative. The gold chloride curve was mildly luetic in 7 out of 11 which were examined.

The mortality was 31 per cent for the whole series, and 4 out of the 15 personal cases died. Four cases recovered wholly in one and a half to four months. The fatal cases lasted a few weeks only. No special treatment was adopted except repeated lumbar puncture, which seemed definitely to relieve 10 of the 15 cases personally dealt with. The writers give a very complete summary of the literature to date.

J. LE F. B.

- [12] A case of encephalitis of the lenticular nuclei diagnosed during life and confirmed at autopsy (Ein Fall von diagnostizierter und durch die Sektion bestätigter Encephalitis der Linsenkerne).—A. VON SARBÓ. *Neurol. Centralb.*, 1920, xxxix, 498.

THE patient was a woman of 50, who as the result of an acute illness of some weeks' duration presented the symptom-complex of generalized rigidity of all limbs, with some contracture in flexion of the extremities, extreme slowness of voluntary movements, immobile facies, spasmodic laughter, katatonia, and general apathy. Tests for syphilis were negative in blood and fluid, nor was there any evidence of disease of the corticospinal tracts. A diagnosis of encephalitis involving principally the lenticular nuclei was made during life, and was corroborated at autopsy, when these ganglia were found to be the seat of marked congestion and small-cell infiltration of the vessels, with neuronophagia and disappearance of the nerve-cells. In his comments on the clinical significance of his case, the author has some trouble in explaining the absence of any involuntary movements of the nature of tremor, and suggests that this absence was due to the acute nature of the illness. It might, however, have been pointed out that, in any condition belonging to the paralysis-agitans group, the clinical picture may vary through all intermediate stages from severe rigidity without tremor to pronounced tremor with little or no rigidity.

S. A. K. W.

- [13] **Acute infectious enteritis with a polyneuritic syndrome.**—FREDERIC J. FARNELL and ARTHUR H. HARRINGTON. *Amer. Jour. Med. Sci.*, 1920, clx, 52.

AN account is given of an epidemic which occurred at the State Hospital for Mental Diseases, Howard, Rhode Island, in the summer of 1917. As a preliminary to their account the writers recall work by Orr and Rows, and by Homen and Laitnen, on infection of the spinal cord via the lymph-spaces following the injection of peripheral-nerve trunks. They point out that one of two lesions may result, either an acute inflammatory reaction with secondary degeneration, or an acute degenerative process, the 'primary' type of lesion.

The epidemic in question was confined to the female wards of the hospital, and resulted in the infection of 47 patients, as well as 4 employees. The onset of symptoms was characterized by acute gastro-intestinal symptoms, nausea, vomiting, diarrhoea with mucus and blood in the stools, and pyrexia of 100° to 104° F. Headache and backache were also complained of. The neuritic symptoms were those of acute peripheral neuritis with pain on pressure over the nerve-trunks, or even upon light touch of the surface in some cases. Both upper and lower limbs showed ataxia, loss of tendon-jerks, and in some of the cases a flaccid paralysis. The epidemic was traced to infected milk from which *Staphylococcus aureus* was grown in excess of all the other organisms found. The blood, faeces, and urine of the patients were also found to give positive growths of the same organism. The infection was looked upon as hæmatogenous via the intestinal tract, which showed the changes associated with acute gastro-enteritis in the four post-mortems made. The peripheral nerves at autopsy showed an acute hamorrhagic polyneuritis. No poliomyelitis was detected.

J. LE F. B.

- [14] **Agrammatism and absence of spontaneity following a wound of the frontal lobe** (Agrammatismus und Mangel an Antrieb nach Stirnhirnverletzung).—E. FORSTER. *Monats.f. Psychiat. u. Neurol.*, 1919, xlv, 1.

THE patient was a soldier wounded in 1916 by a fragment of shell which had produced a large lesion of the cranial vault on the left side over the posterior part of the frontal lobe. When examined some months later, the chief clinical symptoms which he showed were katatonia of the limbs, absence of spontaneity and initiative, and speech disturbances of the nature of agrammatism. The author describes the latter at great length, pointing out that there was no defect on the receptive side, and that the agrammatism involved expressive speech only. Further, there was no evidence that it was a mere phase in a recovering aphasia, for it had existed unchanged from the beginning of the illness. The author discusses various theories which have been advanced to explain agrammatism, and concludes that his case favours the localization of the lesion underlying it in the frontal lobes: he emphasizes the fact that in some of the recorded cases, where agrammatism has been associated with motor aphasia, the pathological evidence did not point to involvement of the temporal lobe, though Pick associates agrammatism with temporal lesions.

The reviewer may point out that Maas, in a paper on the same subject (see Abstract No. 15) criticizes, not very convincingly, perhaps, the description given by Forster of his case as agrammatism, and considers that it belongs rather to the pseudo-agrammatism group.

S. A. K. W.

- [15] On agrammatism and the significance of the right hemisphere in speech (Ueber Agrammatismus und die Bedeutung der rechten Hemisphäre für die Sprache).—O. MAAS. *Neurol. Centralb.*, 1920, xxxix, 465.

THE difficult subject of aphasia is not made any easier by difference of opinion as to the exact definition to be given to agrammatism, a clinical feature of a large number of cases in the aphasia group. After quoting the views of a number of writers, the author follows Pick and Kleist in considering that the essence of agrammatism is inability to form sentences correctly, and that defects in conjugation, declination, and so on should be regarded as a pseudo-agrammatism. He quotes several cases which appear to show that agrammatism in the strict sense is the result of lesions of the temporal lobe, and narrates in considerable detail two cases of his own.

The first was that of a man of 51 who presented the condition in characteristic form. At the post-mortem an enormous lesion was found involving almost the whole of the speech area of the left hemisphere and, from its position, undoubtedly cutting off to a large extent all communication between that area and the corresponding parts of the right hemisphere. The second case was that of a man of 36 who similarly showed agrammatism, particularly that form of it which is known as the 'telegram style' of speech. In this second case the lesion was found to be a large cyst involving the greater part of the left temporal lobe and also the lower half of the central gyri. In both of these cases a phase of practically complete aphasia had been followed by considerable return of speech, both on the motor and on the receptive side, leaving the agrammatism as above mentioned. Very briefly, the author's chief conclusion is that there is no 'centre' a lesion of which produces agrammatism, but that this condition is the result of an attempt on the part of the right hemisphere to assume speech functions as a whole when it is in reality less well equipped for so doing than the left.

S. A. K. W.

- [16] Symptomatology of spinal-cord tumours.—ABRAHAMSON and CLIMENKO. *Jour. Amer. Med. Assoc.*, 1920, lxxv, 1126.

THE authors distinguish extradural, extramedullary, and intramedullary tumours, of which the intradural extramedullary group is the most important from the therapeutic point of view. They divide these into tumours whose density is greater, and tumours whose density is equal to or less, than that of the cord. Extramedullary tumours of the former class commence by causing root signs at the site of the tumour, and as they enlarge may show signs of all stages of compression of the cord up to

complete transection. The level remains practically unchanged throughout the course of the disease. A tumour of the latter class causes little compression, but may interfere with vascular and lymph supply and cause œdema of the cord. The root signs will be less intense, and the compression signs slow in development and relatively slight. The signs of involvement of motor and sensory tracts will be most marked in the region of the tumour, and just above and below it, spreading downwards with diminished intensity, whereas in hard tumours the signs of sensory-tract involvement are greater in the lower spinal segments. In soft tumours there is considerable parallelism between sensory and motor signs, whereas in hard tumours the motor signs are earlier and more marked. In soft tumours the level of involvement may move upwards through two or three segments, xanthochromia is more common, and remarkable exacerbations and remissions in the course of the disease may occur.

*Differential Diagnosis between Extramedullary Soft Tumours and Intramedullary Tumours.*—(1) Pain is present from the beginning in all soft tumours, but only in those intramedullary tumours in which the tumour reaches the posterior roots or surface of the cord. Pain in intramedullary tumours is, therefore, usually a late phenomenon, or may not occur at all if posterior roots or the meninges are not affected. (2) In the vast majority of cases the symptoms develop more rapidly in extramedullary soft tumours. (3) Tract sensory signs and symptoms are more intense and more widespread in intramedullary tumours. (4) Trophic changes are greater in intramedullary tumours. (5) Intramedullary tumours show less rectal and vesical signs. (6) Xanthochromia is rare in intramedullary tumours: it appears only when the tumour reaches the surface of the cord. (7) Deep spinal-column tenderness indicates rather an extramedullary tumour.

*Signs Pointing to the Site of the Tumour.*—(1) *Valuable signs:* (a) Root signs, consisting of neuralgic pains with symptoms pointing to a distal distribution of an affected nerve; (b) Zones of hyperæsthesia immediately above the seat of the tumour and more marked at the homolateral site; (c) Level abolition of skin and tendon reflexes; (d) Deep spinal tenderness; (e) Alteration in vibratory sense; (f) No sweating below the level after injection; (g) Ocular symptoms, such as lateral nystagmus and difference in the pupillary size as well as the palpebral fissure, which may all be present in high cervical tumours. (2) *Less reliable:* (a) Homolateral paralysis; (b) Heterolateral disturbance of pain and temperature sense, reaching its highest level only after considerable cord compression, late in the disease; (c) This sensory loss, when complete, is usually three segments below the actual level of the tumour.

The authors' conclusions are: (1) Progressive spinal-cord diseases giving level signs and symptoms should be carefully observed and studied. (2) When no distinct level can be established, the effect of lumbar puncture should be carefully watched. (3) Xanthochromia of the spinal fluid in level spinal-cord progressive affections usually means spinal-cord tumours. (4) One should operate only when a level has been established. Probing above and below the suspected site, while useful in many cases, often fails.



(5) Operations, frequently by their decompressive effects, help even in intramedullary tumours (6) The possibility of a soft tumour in atypical level cord lesions must be borne in mind, as these are most frequently overlooked.

R. G. GORDON.

- [17] Sacralization of the fifth lumbar vertebra, and the troubles which result from it (La sacralisation de la cinquième lombaire, et les accidents qui en résultent).—G. NOVÉ-JOSSERAND and A. RENDU. *Presse méd.*, 1920, xxviii, 514.

It is well known that the 7th cervical, the 12th dorsal, and the 5th lumbar vertebrae possess attributes of the vertebral region immediately below them, which may be present in such marked degree that the particular vertebra partakes entirely of the character of the region below. When this happens to the 5th lumbar vertebra, it is spoken of as its sacralization. The change may only occur in one half of the vertebra, the other portion remaining normal. Patients with this condition have complained of severe pains of sciatic or lumbago type. Radiography represents clearly the nature of the condition. It has been found in just under 2 per cent in a series of 400 radiographs taken at random, and in nearly 3 per cent of a series of 800 cases where lumbar pain was complained of. This morphological variation of the 5th lumbar vertebra therefore deserves recognition by the clinician. In a well-marked case the transverse processes are much increased in size and tend to approach the shape of the wings of the sacrum. Sometimes they articulate with these latter, and at others are firmly united to them.

The chief clinical manifestation of the condition is pain, but this may be an inconstant symptom. Indeed, the malformation may remain latent indefinitely. As a rule, however, pain is first noticed between the ages of twenty and thirty years—which points to some relationship between the symptoms and the termination of the ossification of the pelvis. The pain may be dull and continuous, or occur only in neuralgic attacks. It is usually in the lumbar region, and may radiate extensively from this—especially towards the sciatic region. The painful region is tender on deep pressure. Some local deformity of the spine may be found: as a rule this is a tendency to lordosis.

As for the cause of the pain, soft structures may be pressed upon, or nerve-trunks may be interfered with or put on the stretch. This applies more especially to the 5th lumbar root, in the distribution of which hyperaesthesia, muscle wasting, and altered deep reflexes may be found.

An interesting association occurs between this condition and spina bifida—the latter being present in about 10 to 15 per cent of the cases, and pointing possibly to a common pathology, i.e., a developmental abnormality.

The treatment has been palliative (drugs, etc.) or radical (removal of the abnormal transverse processes). In four cases operative interference produced some improvement, but as a rule the clinical condition is not sufficiently severe to justify operation.

W. JOHNSON.



- [18] **Hemiplegia in pregnancy** (L'hémiplégie pendant la grossesse).—E. DUCHOT. *Gaz. des Hôp.*, 1920, xciii, 133.

PUERPERAL hemiplegia, so-called, includes a rather heterogeneous collection of pathological states from which two main groups emerge: (1) Hemiplegia following the confinement, and (2) Hemiplegia during the pregnancy itself. The author bases his review of the latter condition on an analysis of some 46 cases, personal and from the literature. Apart from the ordinary causes of hemiplegia (syphilis, cardiac disease, etc.), to which of course the pregnant woman as well as any other may be liable, certain varieties of hemiplegia are apt to be associated with pregnancy. In 17 of the 46 cases the patient, although often enough quite young, suffered from a cerebral hæmorrhage. The physiological hypertrophy of the left ventricle, and increased richness of the blood, considered by some as capable of explaining the cerebral hæmorrhage, are in reality insufficient, and an additional factor seems to be necessary. It is true that during the actual labour a cerebral hæmorrhage of mechanical origin may occasionally occur, but the great majority of cases are attributable to the presence of renal disease—the albuminuria of pregnancy. Even in these cases, however, the possible effect of localized cerebral œdema and of the toxic elements in the uræmic state ought not to be ignored. Next to these albuminuric cases, embolism from a pre-existing cardiac condition seems to be the second most common cause of hemiplegia in pregnancy, whilst the third most common variety is meningeal hæmorrhage. A number of cases of this kind are on record, but the explanation is unfortunately not clear. Meningeal hæmorrhage may occur in the absence of any albuminuria or cardiac disease, or any evident visceral or toxic-infective condition. One ingenious theory is that increased activity of the suprarenal glands in pregnancy, as revealed by a condition of hypercholesterinæmia, leads to an increase in blood-pressure from time to time and so to meningeal hæmorrhage. This variety of hemiplegia is, as a rule, progressive, and can be diagnosed with accuracy by means of lumbar puncture.

It will be seen that the hemiplegias of pregnancy are not the direct, but the indirect, result of that state. Pregnancy exercises on their appearance a mechanical, toxic, or dyscrasic influence.

S. A. K. W.

- [19] **Infantile hemiplegia—a functional therapeutic study** (Hémiplégie infantile, étude fonctionnelle thérapeutique).—C. DUCROQUET. *Presse méd.*, 1920, xxviii, 504.

IN infantile hemiplegia the weakness is sometimes confined to the ankle movements. If the knee movements are found to be defective in a given case, then the ankle is, as well, invariably involved. Finally, if the hip movements are weak, then both knee and ankle movements are found to share in the disability.

Clinically the degree of paralysis is to be gauged by: (1) The amount of contracture; (2) The active power still remaining in the weakened muscles.

1. The amount of contracture must be investigated carefully in the

case of each joint. It is found to diminish as the proximal portion of the limb is approached. (a) In the examination of the foot, the subject is made to lie on his back on a table, with the legs from the knees downwards hanging over the edge. In this position the feet roughly form a right angle with the legs. On now raising the foot on the affected side until the whole leg is in a straight line, a position of equinus—to a greater or less degree—becomes assumed by the foot, the amount of the equinus being dependent on the degree of the contracture present in the calf muscles. (b) Similarly, when examining the degree of contracture of the knee-joint, the subject is made to lie on his back, but this time the legs lie horizontally on the table. The child is then aided into a sitting position, and the knee of the hemiplegic side is at once seen to rise from the table and assume a semiflexed position. This is due to contracture of the hamstring muscles, and is comparable to Kernig's sign. (c) In order to investigate the state of the hip flexors, the subject is placed in the prone position and the heels are drawn up towards the buttocks. In this position, owing to the contraction of the iliopsoas and the tensor fasciæ femoris, the hip on the affected side fails to extend to the full amount required, with the result that this side of the pelvis becomes raised from the bed. These phenomena are well shown in the diagrams illustrating the article.

2. As regards the power present in the weakened muscles, it is the slowness of the voluntary movements which is characteristic of hemiplegia—this slowness being due to agonists having to overcome the contracture of antagonists. The carrying out of the simplest volitional movements serves for the demonstration of this condition.

The gait in infantile hemiplegia depends on the extent of the paralysis. If the contracture is limited to the muscles which move the ankle, the child walks on the ball of the foot, keeping the knee flexed until almost the end of his step. Where there is knee contracture as well, the knee remains flexed continually whilst walking; and in the third variety, where the foot, knee, and hip all exhibit some contracture, the affected leg can only function somewhat like a stilt. Owing to this stilt-like movement of the hemiplegic leg, the trunk is made to perform a 'bowing' movement during the process of walking (*mouvement de salutation*).

TREATMENT.—The analysis of the degree of contracture and of the amount of residual movement in the weakened limb forms a basis for therapeutic measures. The muscles involved should first be treated by passive movements directed towards diminishing their contracture. These must be followed by simple re-education exercises designed to develop the power and rapidity of their contraction. Special measures must be taken for dealing with the equinus condition—these varying with the degree of deformity which may be present.

W. JOHNSON.

[20] The re-education of hemiplegics.—PIERRE KOUNDJY, N.Y.  
*Med. Jour.*, 1920, cxi, 884.

THE author's system is based on a formula of Todd—"I know of nothing so profitable for the paralyzed members as a regular system of exercise,

active when the patient is able to perform them, and passive if he be incapacitated". Methodical massage and motor re-education improve the nutrition of muscle and fibrous tissue, and in addition re-establish co-ordination of movement. The statistics of the Salpêtrière gathered by Possard over the last five years show that of the cases of hemiplegia so treated, 3 per cent were completely cured, 17·7 per cent were greatly benefited, 64·7 per cent showed notable improvement, while in 17 per cent the result was doubtful. As a preliminary, careful digital exploration of the muscles and estimation of their tone are made before massage is started. The persistent absence of any 'muscle shock' on attempted movement is regarded as prognostically unfavourable. Examination reveals the muscles most affected by the paralysis, but it is not possible, in the writer's opinion, to make a useful topographical table therefrom, as the same muscles are not affected alike in a series of hemiplegies. It is noticed that the muscular atrophy of hemiplegia depends more upon the contracture of antagonists than upon the severity of the paralysis. Quoting Brissaud—"Muscular atrophy in hemiplegia is always accompanied by contracture, which is followed by flaccid hemiplegia"—the writer states that in all his cases of residual hemiplegia atrophy was present.

Further details in the treatment are the employment of superficial and deep massage, with light longitudinal and circular pressure at first, followed by digital vibrations; such treatment is adopted as early as twenty days after the attack. The later massage consists of percussion, progressive kneading, and varieties of tapping, all movements to be made gently, and limited to the affected portions of muscle. In massage of the nerve-trunks, combined longitudinal and surface pressure with one hand and vibrations with the other are recommended. Where some muscles are spastic and others hypotonic the latter alone are treated, while the former are relaxed as far as possible during the treatment. Massage is gradually succeeded by passive and active movements. It is remarked that in general the patients do not like to move the affected limbs, but they usually desire to walk at the earliest opportunity: hence the almost invariable sequel that the affected lower limb recovers before the upper member. The author does not add, as a qualification to this statement, that the more recently evolved complex co-ordination of the upper limb in man certainly explains much of the disparity in recovery of function between the upper and lower limbs of the hemiplegic. When the patient is able to perform a few active movements he is then started upon a course of muscle re-education. The tendency to associated flexion movements in the arm is countered by education with the elbow extended while the movements at the shoulder are being encouraged. When the shoulder movements are established, elbow flexion is allowed, and the hand is next educated in grasping large objects, such as a tumbler, etc. The act of walking is re-educated by active leg extension until the affected foot reaches the ground. The patient is invariably made to place his affected leg first in taking a step: this is in contra-distinction to Erben's method, where the strong leg is advanced first. The writer believes that the advancing of the affected leg first will

correct the dragging defect so commonly present in the gait of a hemiplegic. Flexion movements of the affected leg are taught with the patient sitting. The glutei and external rotators are exercised in a co-ordinated walk as follows: (1) Flexion of thigh on pelvis; (2) Extension of leg; (3) Exaggerated rotation of foot outwards; (4) Displacement of affected limb.

The good results of the whole treatment are explained on the assumption that re-education creates supplementary centres which replace those destroyed. The simple appliances used are a double inclined platform, a rolling chariot, benches of various heights, and traction appliances with weights and pulleys.

Adjuvants are heliotherapy, thermotherapy, and balneotherapy: but electric treatments are deprecated on account of the tendency they have to increase the contractures.

J. LE F. B.

[21] Condenser tests in the diagnosis and prognosis of nerve injuries.

—C. WORSTER-DROUGHT. *Brit. Med. Jour.*, 1920, ii, 389.

THESE observations are based upon experiences with some 2000 cases of injury to nerves of the upper and lower limbs seen while the author was acting as neurologist to the Woolwich Military District from 1916 to 1919. It is pointed out that the faradic coil is not an accurate instrument for testing muscle reactions, since the factors upon which the response depends—voltage, duration of each electrical impulse, rate at which the impulse is delivered—are variable; further, the majority of cases of nerve injury fail to show any response to the faradic coils in clinical use. Galvanism, as ordinarily used for testing, is similarly inaccurate, for voltage, milli-ampère readings, resistance, etc., require standardizing. In the condenser set the voltage is fixed and the duration of each impulse known; provided that the same precautions are invariably taken to minimize skin resistance, and pads of the same size always used, we have a fairly accurate means of testing muscle reactions. The condenser used was the modification of the Lewis Jones set suggested by Purves Stewart. The condensers are charged from a direct current, and, by means of a rheostat, can be fixed at 100 volts. The scale consists of twelve stops varying in capacity from 0.016 to 4.0 microfarads; for convenience, a muscle is spoken of as reacting on, for example, No. 6 stop, meaning a contraction occurs with a capacity of 0.10 microfarads at 100 volts. Before testing, the limb is immersed in warm water for five minutes, and two wooden-handled electrodes, fitted with circular pads 1 in. in diameter, are used in the test, one being placed on the motor point and the other elsewhere on the muscle. Working from above downwards, the various capacities are tried until the lowest stop on which the muscle shows any appreciable reaction is reached. Thus, when it is stated that a certain muscle reacts on No. 8 stop, we mean that the muscle will not react on any stop lower than No. 8.

As all normal muscles do not react on No. 1 stop (0.016 mf. at 100 volts), extensive observations were necessary to determine the normal standards; these are detailed. In general, it may be said that the larger and more superficially situated muscles of the arm react on No. 1 stop,



the deeper muscles of the forearm react on No. 2, while the intrinsic muscles of the hand react on No. 3. No definite conclusions can be drawn from condenser tests made within one month of injury.

With regard to injuries to mixed nerves, although motor paralysis and complete sensory loss in the area of cutaneous supply may be found at an examination made more than a month after injury, the nerve may still recover its function apart from operation. It is in these cases that condenser tests are of great value. If, in lesions of the musculospiral, median, anterior crural, sciatic, external or internal popliteal nerves, the majority of the muscles react on No. 7 stop (0.25 mf.) or below, an incomplete lesion may be diagnosed and recovery expected without operation. The same may be said of an ulnar-nerve lesion in which the intrinsic muscles of the hand react on or below No. 8 stop.

If no response is obtained below No. 8 in muscles normally reacting on No. 1 or 2 stops, the case should be treated on the usual lines and re-examined after an interval of six weeks. If no improvement is then found in the condenser reactions, operation should be advised. At operation the nerve is usually seen to be compressed by scar tissue or partially divided. If actual retrogression is found after the six weeks' interval, exploration should be advised without hesitation. If the muscles supplied by the injured nerve fail to react on any stop below No. 10, the majority reacting on Nos. 10 to 12, the nerve is suffering from severe compression, partial anatomical division, or, in some cases, complete division, and is most unlikely to recover apart from operation.

The author has met with comparatively few cases, examined at a period exceeding two months from the date of injury, in which subsequent operation has revealed complete division of the nerve, to show a response on any stop below No. 12 in any muscle supplied by the injured nerve. In the case of lower-limb muscles, no response can usually be obtained even on No. 12 when the nerve is completely divided. When all muscles supplied by the injured nerve fail to react on the highest stop, therefore, complete division, either physiological or anatomical, is usually present. If not anatomically divided, the nerve is found to be so intimately involved in scar tissue as to render resection and end-to-end suture necessary.

As in severe injuries involving the lower-limb nerves the muscles often fail to react even on the highest capacity (No. 12) at 100 volts, it has been suggested that it would be desirable to use a higher voltage than 100 for testing leg muscles. Although indicated for the more accurate estimation of reactions, for practical purposes the author's experience has been that if the muscles fail to react on No. 12 at 100 volts, operation will certainly be required. Whenever he has seen such a case, operation has invariably been advised, and in all cases revealed a severe injury which apparently could only recover as the result of surgical intervention.

A practical difficulty sometimes arises when muscles are much atrophied; on No. 8 or No. 9 stop being reached, the condenser discharge produces marked contraction in muscles in the neighbourhood of those in which stimulation is being attempted. Although unsatisfactory from the point of view of exact testing, the practical disadvantage of the occurrence



is not as great as might appear, for it may be safely assumed that the severity of the nerve lesion is such as to require operation. In all cases met with, the operation advised was never found to be unnecessary. With regard to injuries to mixed nerves with only partial cutaneous sensory loss, the muscles innervated by the affected nerve seldom fail to react on or below No. 10 stop. If reacting on No. 8 or below, recovery almost invariably ensues without operation. Cases in which the majority of muscles react on No. 10 should be examined every four weeks; if no improvement be apparent after the third examination, exploration should be advised. Some cases appear to remain stationary; in such instances operation usually reveals moderate involvement in scar tissue or a partial division of the nerve, and surgical treatment is followed by rapid improvement.

As regeneration proceeds, there is usually a progressive diminution in the capacity of the condensers required to evoke a contraction in the muscles supplied by the damaged nerve. When the condenser reactions improve progressively month by month, it may be safely assumed that recovery is taking place in spite of the continued absence of voluntary movement. When the reactions approach No. 8 stop from above, voluntary movement may be expected shortly to appear. If, after operation, no change in the condenser reactions takes place month after month, it is probable that the operation has been unsuccessful and that no recovery will occur.

It is not suggested that one should rely solely on quantitative condenser reactions; other important factors often have to be considered, such as the condition of the paralyzed muscles, the absence or otherwise of systematic treatment, sensory changes, etc. The purpose of the communication is to illustrate the value of condenser tests in assisting one to arrive at an opinion as to the extent of a nerve lesion, the nature of the treatment to be recommended, and the ultimate prognosis.

AUTHOR'S ABSTRACT.

## TREATMENT.

- [22] *Vertigo, and its treatment by adrenalin* (Le vertige et son traitement par l'adrénaline).—M. VERNET. *Presse méd.*, 1920, xxviii, 462.

THE writer is here concerned with that form of vertigo which results from vasomotor or toxic (sympathetic or endocrine) disturbance of the vestibular apparatus, and for which, on examination, no organic cause can be found. Such vertigo is fundamentally a labyrinthine phenomenon, and its cause is irritative in character. The feeling of giddiness is usually as fleeting as the cause which produces it. Vasomotor stasis of the vestibular branch of the internal auditory artery, leading to a congestion of the semicircular canals, produces the pure form of vertigo, i.e., a sensation of giddiness which is unaccompanied by deafness or tinnitus. These latter do occur concurrently, however, if the vasomotor disturbance involves in addition the other (cochlear) branch of the internal auditory artery.

Vasomotor disturbances of the labyrinth may be induced by (1) disorders of the middle and internal ear, (2) abnormal sensory stimuli from any of the cranial nerves or nerves of the splanchnic system, and (3) lesions of the medulla, cerebellum, or cerebrum. The vertigo of the menopause, of chlorosis, of Graves' disease, of gout, etc., is traceable to vasomotor disturbances which are secondary to a disordered state of the internal secretions.

The author points out that, associated with an attack of vertigo, there are usually nausea, vomiting, sweating, dilatation of the pupils, and various vasomotor symptoms. These occur also in conditions where there is marked intestinal irritation, and are, in fact, well-recognized effects of sympathetic activity (sympathicotonia). Vertigo, he insists, must be regarded in this light, i.e., as one of the several results of a generalized activity of the sympathetic nervous system. The evanescence, variability, abrupt appearance, and disappearance of vertigo, all point to a confirmation of this view.

The general arterial tension in this form of vertigo may be either increased or decreased—it is immaterial which, the important fact being that vertigo occurs as soon as the vasomotor equilibrium in the labyrinthine apparatus is disturbed. As a rule the disturbance is a vasomotor congestion rather than an ischæmia.

TREATMENT. — Quinine, salicylates, and opium are well-established remedies which lead to a general lowering of arterial tension. The drug *par excellence*, however, which is of value in sympathetic disequilibrium is adrenalin. For four years the author has administered it for this type of vertigo. He gives from 5 to 20 min. of the 1-1000 solution twice a day by the mouth. At the end of every ten days the drug is withheld for a short period in order that toxic effects may be avoided. The results have been encouraging.

W. JOHNSON.

- [23] **Hypertonia of the sympathetic, and its treatment by eserine** (L'hypertonie du sympathique, et son traitement par l'ésérine).—  
L. CHEINISSE. *Presse méd.*, 1920, xxviii, 466.

THE writer classifies individuals into two groups—the vagotonics and the sympathicotonics. The former are hypersensitive to pilocarpine and atropine, and the latter to adrenalin. The former give a normal or exaggerated response when the oculocardiac reflex is tested; and the latter none at all, or perhaps an inverted response. In appearance the vagotonics are pale subjects with cold bluish hands and small pupils. The pulse is sometimes slow, but more frequently the heart-beat is irregular and numerous extrasystoles occur. There is excessive gastric secretion, hyperchlorhydria, constipation, and a condition of arterial hypotension. Sympathicotonic individuals, on the other hand, exhibit marked vasomotor instability (described as waves of heat, etc.), the pupils are dilated, there is tachycardia, dilatation associated with atony of the stomach, hyperæsthesia of the epigastrium, and a definite rise in blood-pressure. There may be attacks of forcible pulsation of the abdominal aorta, attended with considerable discomfort (solar crises).

In such conditions of hypertonia of the sympathetic, the administration of eserine has produced beneficial results. The tachycardia especially is controlled and intestinal activity is promoted. Neutral eserine salicylate is the preparation which the author favours, and, if digitalis is given in combination, the best results are obtained. The dose of the eserine salt has been 10 min. of a 0.1 per cent solution three times a day by the mouth. No adverse effects are produced by this amount. The sulphate and the hydrobromide are not so reliable. In organic visceral disease and conditions of colic, eserine is contra-indicated and atropine should be given.

W. JOHNSON.

- [24] Borico-potassium tartrate and boric medication in the treatment of epilepsy (Le tartrate borico-potassique et la médication borée dans le traitement de l'épilepsie).—MARIE, CROUZON, and BOUTTIER. *Presse méd.*, 1920, xxviii. 713.

BORICO-POTASSIUM tartrate or soluble cream of tartar has long featured in *materia medica*. The authors have found it to be the most efficacious way of prescribing boric acid for epilepsy. It is not intended to displace potassium bromide, but only for use with patients who show an intolerance towards this drug. Out of a hundred cases of epilepsy, ten patients were selected who were intolerant to potassium bromide. Ordinary borax, sodium tetraborate, and borico-potassium tartrate were the preparations of boric acid experimented with. Both the number and the intensity of major and minor attacks were lessened in every case. A second similar series of ten cases showed the same result. The improvement remained sustained up to eight months. In one or two cases suspension of the drug led to an exacerbation of attacks, which a re-administration was successful in controlling.

The administration of borico-potassium tartrate may lead to digestive disturbances which, however, are slight and fleeting in character. It is usually given in a dose of 20 to 40 gr. Patients have appeared to tolerate it much better than the other salts of boric acid. An important feature is that there is less clouding of the mental faculties than occurs with bromides; also the reflexes are considerably less depressed.

The authors conclude by alluding to the beneficial effects which may follow the administration of potassium bromide, or of luminal, or of both, in conjunction with borico-potassium tartrate. Only experiment in individual cases will show which combination is the most suitable.

W. JOHNSON.

## Psychopathology.

### PSYCHONEUROSES AND PSYCHOSES.

- [25] A study of primary somatic factors in compulsive and obsessive neurosis.—L. PIERCE CLARK. *Internat. Jour. of Psycho-analysis*, 1920, ii, 150.

THE writer finds that in many cases of compulsive and obsessive neurosis there is some somatic defect of instinct, such as tone deafness, colour blindness, inability to appreciate rhythm, or incapability of graceful gesture and movement. The fault is such as to prevent the individual from dispossessing the dominance of the ego-consciousness and allowing the free and unconscious externalization of the libido or desire-trend to fixate upon an object love or some field of interest. The neurosis, starting as a species of pernicious emotional repressions, soon undergoes, as the child grows up, a distinctive symbolization of the original fault and its conflicts. As a result of the neurosis many compulsives are deprived of normal associations and adjustments to the home, school, or playground; not a few, too, seem to have an inherently defective inaptitude to take up friendships or social life. Cases are quoted in which the patients suffering from this type of neurosis showed this psychobiologic inferiority of instincts, and where a knowledge of the conflict enabled a better adjustment to be made, with an amelioration of the symptoms. (In a footnote the Editor remarks that the symptoms mentioned by Dr. Clark would be considered by other psychopathologists to belong to anxiety-hysteria.) The writer emphasizes the importance of the necessity, for those who train children, to strive to cultivate every trait of emotional expression to the utmost, not alone that the individual may escape neurosis, but that it may start its life work with as few emotional and social handicaps as possible. All compulsive neurotics need to be encouraged in their efforts to take up some form of work or play that enables them to make good the innate faults of childhood and to re-educate themselves in this lack of early training.

C. W. FORSYTH.

- [26] The future of Service patients in mental hospitals.—WILLIAM ROBINSON. *Jour. of Ment. Sci.*, 1921, lxvii, 40.

THE paper consists of an analysis of the cases of 140 Service patients in mental hospitals from the points of view of the etiology, the type of mental alienation, and the prognosis. The author states at the commencement that the public only imperfectly appreciates the true factors in the causation of the mental disorder, the varieties of psychosis encountered, and the prognosis; while trouble is always arising with the relatives in regard to the presence of Service patients in asylums and the failure to adopt certain methods of treatment to which prominence has lately been given by the Press.

He summarizes his conclusions, from which the following may be abstracted. A large percentage of Service patients have been sent to mental hospitals, after prolonged treatment in military hospitals, because

they were considered incurable, and these patients are not of the type which can be cured by suggestion, psychotherapeutic conversations, hypnotism, or psycho-analysis. The mental condition of Service patients is such that special institutional treatment is necessary, for the welfare of the patients and the safety of others. As a class the Service patients have replaced the pre-war class of chronic mental cases, and in the former the history of hereditary instability and criminality is more frequent, while the incidence of alcohol and syphilis as causative factors is unusually great.

The author concludes that it is impossible to arrive at any other opinion than that the Service patients would, as regards the majority, have been patients in mental hospitals sooner or later had there been no war. As regards the minority, they would probably have constituted the pre-war group of waifs and strays, and formed the population of the casual wards of workhouses and the inhabitants of the prisons. He excuses himself for laying stress on facts which are within the experience of the majority of his readers, on the grounds that the public is disposed to regard the Service patient as one who is curable and who ought to be cured, and that the statement that the cases are incurable is likely to lead to accusations from laymen of prejudgement and unwillingness to resort to recently advocated methods of treatment when old ones are ineffective.

THOMAS BEATON.

- [27] Gas neurosis syndrome.—H. S. HULBERT. *Amer. Jour. Insan.*, 1920, lxxii, 213.

This is said to be similar to the non-concussion type of so-called shell shock, and is found in those who have been exposed to gas warfare. The symptoms are various degrees of physical movements related to altered or increased respiration, anxiety, altered consciousness, and involuntary motor movements. If recognized early, suitable treatment will cause recovery. Its severity is not in proportion to the organic damage from being gassed, but is in proportion to the make-up and military maladjustment of the individuals affected.

C. STANFORD READ.

- [28] A psycho-analytic study of manic-depressive psychoses.—LUCILLE DOOLEY. *Psycho-analytic Rev.*, 1921, viii, 38 (continued).

This study was undertaken primarily to determine whether or not psycho-analysis could be applied to the severe cases with beneficial results, and also to trace the symptoms back to phases of character development and to the specific crises in the lives of the patients where the arrest of emotional growth occurred. Nothing new in the psychology of the manic is here found, but there is confirmation of the view that this psychosis is a result of mental or emotional conflicts and repression, being of the compensatory type. The manic in his excitement speaks out quite frankly the wish that is kept out of even his secret conscious thought at other times. This disorder cannot be attacked at present by the psycho-analyst with the same hopeful and free spirit which he brings to the psychoneuroses or even to schizophrenia. In the depressed phase the patient may be inaccessible from inability to bring his own thoughts to bear on the problems.



while in the manic phase his distractibility makes true analysis impossible, though the content of his speech may be used later for this purpose. In the normal periods the thoughts and feelings of the disturbed period are repressed, and a powerful resistance is encountered to recalling them. The personality of the manic-depressive also presents an obstacle. Those who have frequent manic attacks tend to get the upper hand of the analyst, and, though the transference seems good, the analyst is only an appendage to the greatly inflated ego. With the other type it is difficult to get them to make much effort, and as the conflicts are so deep-seated there is danger in meddling with the repressions. A suicide in a depressed patient, even a homicide in a manic, may be the result of incautious delvings into his inner life. The analyses of three cases are then given at some length.

C. STANFORD READ.

[29] **An analysis of suicidal attempts.**—LAWSON G. LOWRY. *Jour. Nerv. and Ment. Dis.*, 1920, lii, 473.

THE author analyzes 46 attempts at suicide, and finds that 16 were cases of dementia præcox, 9 of manic-depressive insanity, 5 of psychopathic personality, 3 of psychoneurosis, 13 various. The direct causes of the attempt in 14 were depression; in 7, direction of hallucination or delusion; in 6, to escape persecution; in 7, to escape physical or mental disease or social unhappiness. The methods chosen in order of frequency were: cutting throat or artery, gas, poison, drowning, hanging, jumping from a height, swallowing foreign bodies, strangulation, shooting, and setting fire to clothing. All the cases were insane, psychopathic, or acutely alcoholic at the time of attempt. Normal people occasionally commit or attempt suicide.

R. G. GORDON.

[30] **A recurrent dream, a precursor of senile dementia.**—CHARLES W. BURR. *Amer. Jour. Insan.*, 1921, lxvii, 409.

THIS is the report of a case of a man who, while seemingly in good health, though really in the prodromal stage of senile dementia, repeatedly dreamed he was suffering from melancholia, and in the dream described his agony of mind to his long-dead mother, and begged her sympathy and help. After an analysis of the patient's life history, the writer gives his explanation of the genesis of the dream as follows. All through the patient's mature life he had the fear of a mental breakdown, though he was not willing to admit it. The fear became so great that if anything stimulated his cortical cells during sleep they worked on what, during waking hours, obsessed him. Any Freudian interpretation is regarded as unnecessary and put out of court. It is pertinently asked whether many persons approaching a mental breakdown, preceded by a long prodromal period during which forebodings of evil are present, have a similar experience, and whether a physician's knowledge of it would not be of use in prognosis and in starting early treatment.

C. STANFORD READ.

- [31] Parole system and its relation to occupational therapy.—A. J. ROSANOFF and T. S. CUSACK. *Amer. Jour. Insan.*, 1920, lxxvii, 149.

UNDER average conditions in state hospitals it is possible to increase paroles to hitherto unrealized numbers, with benefit to all concerned. The need for institutional care occurs only under circumstances which give rise to serious social maladjustment. Through inertia and other factors, patients are often held for years or life in the absence of external initiative. In the New York State Hospital service the growth of the parole system has been marked during the last decade. In 1911 the average daily number on parole was 2.5 per cent, in 1918 5.4 per cent, while in the Manhattan State Hospital it was then 8 per cent. In another state hospital a special survey to seek out those suitable for parole resulted, in 1920, in an increase there to 10.7 per cent. The authors see no reason why a percentage of 20 should not be reached and maintained. Active opposition is met with from physicians, nurses, and attendants to the parole of working patients. Extramural employment should be found for these cases, and they should be visited regularly by social workers. It is found that the removal of working patients resulted in the others receiving better oversight. Occupational therapy is then discussed. The important question of the selection of patients for parole is dwelt on, and it is stated that it seems impossible to predict for certain whether a given patient will get along well outside or not, and an actual trial of parole affords the most trustworthy means of judging. Other details of the system, including the essential factor of a well-organized social-service department, conclude a suggestive article.

C. STANFORD READ.

## PSYCHOLOGY.

- [32] Emotions and instincts.—H. C. LINK. *Amer. Jour. Psychol.*, 1921, xxxii, 134.

THE article is a critical appreciation of the various attempts to identify the instincts with the emotions. After a brief discussion of the character of that identity as outlined by James, Sherrington, Cannon, and McDougall, the writer concludes that it is not possible to demonstrate by physiological methods upon animals the connection between emotions and bodily activities. Watson's work is favourably quoted as obviating the philosophic difficulties involved in earlier theories.

The author passes to a criticism of McDougall's attempt to classify the activities of life as developed from seven primary instincts. He points out the inadequacy of his two criteria of the primary instincts, but commends McDougall's analysis as an attempt to account for the dynamic nature of instinct by means of the emotive forces, the failure of their classification not impairing their validity as factors in the energy of behaviour.

He concludes by deprecating attempts to identify instincts with arbitrary groups of emotions, and emphasizes the highly speculative character of the conclusions drawn in this department of work.

R. DASTIE.

- [33] The conditioned reflex and the Freudian wish. GEORGE HUMPHREY. *Jour. Abnorm. Psychol.*, 1920, xiv, 388.

THE author distrusts the psychology of Freud in regard to the anthropomorphical nature of the wish; he feels that the necessity for calling in an innumerable number of disconnected phenomena should not arise, and that it should be possible to reduce these apparently distinct entities to a more simple form. This, he thinks, can be accomplished by taking into consideration the mechanism of the conditioned reflex, and he demonstrates by several examples how the complicated conditioning of what at first was a simple response may give rise to a number of apparently quite diverse dissatisfactions, all of which, however, are to be expressed ultimately as the non-fulfilment of the original response. He sums up with the following: By simultaneous concurrence there are set up systems of interconnected conditioned reflexes, the reaction to the combined stimuli of which constitutes the Freudian wish. The constituent reflexes come to condition each other as well as the joint reaction, and so, when some are excited and others not, the whole mass is thrown into a condition of stress, the effect of which upon the organism depends upon the nature and driving force of the system disturbed. Thus is born the wish as the ordinary man understands it, which is a mild form of conflict, the discomfort of which in the pathological cases as well as in the milder form is due to the partial excitation of a system of reflexes.

THOMAS BEATON.

- [34] A system for explaining affective phenomena.—LEONARD THOMPSON TROLAND. *Jour. Abnorm. Psychol.*, 1920, xiv, 376.

IN this interesting paper the author extracts from all conscious experience a definite variable which he terms the affective intensity at any moment, positive magnitudes of this variable corresponding to pleasant states of consciousness, and negative to unpleasant states. The physiological correlate to this psychological variable he regards as the rate of change of conductance in the synapses in the cortical paths whose functioning is at the base of the consciousness at the moment; so an inhibition or a diminishing conductance in a synapse in any particular cortical path would be appreciated in consciousness as a state of unpleasant affection, and would be represented by a negative value of the variable, and vice versa.

The cortex being the organ of the process of learning, it is necessary that its initiative should be controlled in some way by the practical effects of experience, and this is provided for by the action of the (Sherrington's) bene- and noci-receptors. The stimulation of a bene-receptor system at the time of the activity of certain cortical paths causes a facilitation of those paths—in other words, an increase in the conductivity of their synapses; inhibitions result from the activity of the noci-receptors, while both these processes must leave a permanent effect on the state of conductivity of the synapses concerned. Again, it is clearly not necessary for the actual noci- or bene-receptors to be always stimulated; the original cortical process may become conditioned, and so may in itself set up a facilitation or an inhibition.

From an examination of the mathematical capacities of the selected variable it is clear that the tendency of cortical activities is along the lines of a physiological hedonism in which there can be no reference to the future or even to the present, but only to the past. The conditioning, as regards its association with one or other of the receptor systems of Sherrington, of a cortical process, is to be regarded as the basis of the psychological complex, a primarily neutral idea or stimulus having acquired an affective value; while the conditioning of one cortical process with both a noei- and a bene-receptor system represents the formation of psychological conflict. The application of this line of treatment to the question of instinct shows the necessity of dealing with the instincts from the affective rather than the efferent side, and the author is very doubtful whether any instinctive responses are mediated through connections in the cerebral cortex.

THOMAS BEATON.

[35] **Psychical selection: expression and impression.**—C. LLOYD MORGAN. *Brit. Jour. Psychol. (Gen. Sect.)*, 1921, xi, 2.

THE author uses the term expression as the correlative to impression on the understanding that impression is normally provocative of behaviour in the organism which receives it. The utility of expression arises from the impression it produces. Most of the examples are taken from bird life, where the phenomena of sexual selection afford excellent illustrations of the psychical nature of impression. In sexual selection two factors may be distinguished: (1) Those which are not primarily dependent on the impression they make on the mate, e.g., those which determine victory in combat with rivals; (2) Those which are thus dependent, since they allure or excite an individual of the other sex. It is with the second of these that the author is concerned, for it is they which indicate 'choice', even if choice be no more than unconscious preference. When *this* expression evokes response while *that* does not, we infer from the response that the female chooses *this* male in preference to *that* one. All that is implied is that expression produces such impression as leads to responsive behaviour.

The author shows how both Darwin and Wallace agree that certain features of structure and behaviour appeal to the mind, and that in the absence of this appeal these features would not be what or as they are. "Their evolution depends on a psychical factor—on some impression which they produce." Taking the analogy of hunger; it does not follow that the hungry animal will eat anything. Notwithstanding the condition of hunger there is generally a preference for *this* over *that*, and it is not unreasonable to suppose that even when the wave of pairing sex-hunger comes over the female the display—expression—of *this* male may make an adequate impression while the advances of *that* male do not. Lloyd Morgan seeks to demonstrate the intimate connection of biological and psychological values, and protests against an undue sundering of 'natural' and psychical selection. They are but diverse aspects of that which is found in the given nature of one reality. The former works by elimination from below upwards; the latter by preferential appeal works from above downwards. The net result in either case is the preservation of efficiency.

ALFRED CARVER.



- [36] **A brief résumé of Freud's psychology.**—W. H. B. STODDART. *Jour. of Ment. Sci.*, 1921, lxxvii, 1.

ASSERTING his unworthiness, as a mere disciple, to assume the rôle of apostle to the greatest psychologist who has ever lived, Dr. Stoddart indicates the objections to the Freudian doctrine which are likely to arise owing to the repressions existing in the minds of those to whom the psycho-analytic methods are unfamiliar, and pleads that "they may not be led away from the path of scientific investigation by sentimental objections based upon their own psychical make-up".

He briefly outlines some of the more prominent Freudian mechanisms, and then proceeds to indicate the importance of the part played by the repressed sexual perversion in modern social life. It is his opinion that, in regard to the total ban placed by social convention upon any mention of the one fundamental biological reason for existence, that of reproduction, while at the same time contemplation of and indulgence in the other, that of self-preservation, was permitted, the explanation is to be found in the data concerning the sexual perversions. He computes that homosexuality, which is only one of the perversions, was present in 25 per cent of the population, and he is led to the conclusion of Freud that no one is quite normal sexually; it follows, therefore, "since very few people are willing to acknowledge any abnormality, sexual matters in general become taboo to such a degree that the repression acquires the force of an inborn instinct".

Dr. Stoddart refutes the idea that suggestion plays any part in the results obtained by the psycho-analytic method; the true analyst should avoid both guiding the patient in his thoughts and advising him as to any line of conduct. He considers that, of the psychoses, manic-depressive states are the most hopeful of cure by the Freudian method, while paranoia and paranoid states might be treated, but only in the earliest phases. He feels very doubtful as to the possibility of psycho-analytic treatment ever finding a place in asylum work, because of the fatal interruption of the work by administrative duties.

THOMAS BEATON.

- [37] **Recent advances in psycho-analysis.**—ERNEST JONES. *Brit. Jour. Psychol. (Med. Sect.)*, 1920, i, 49.

THIS extremely important paper was read before the Psychological Society in January, 1920, and is also published in the *International Journal of Psycho-analysis*, vol. i, part 2. The matter of it is so highly condensed as to render any useful abstraction practically impossible, and all those interested in psycho-analysis will do well to consult the original. As might be anticipated in a subject in which Freud remains as ever the pioneer, most of the recent advances emanate from him. The two most striking sections of the paper are those relating to narcissism and meta-psychology. The interpolation of a narcissistic stage between the stages of auto-erotism and object love has carried the libido theory much farther than previously seemed possible, and may be expected to yield still greater results in future researches. Narcissism plays a paramount part in the



formation of the ego ideal, and thus illuminates many hitherto dark corners in psychopathology. The conception of narcissism has also a direct bearing upon the problem of war neuroses, and its understanding should serve as a corrective to those who hold that the war has disproved Freud's deductions. By the term 'metapsychology' Freud denotes a psychology which will regard every mental process from three points of view, viz., the dynamic, the topographical, and the economic. Dr. Ernest Jones gives a most valuable review of the salient points from the five essays wherein Freud has approached this interesting development of his researches. Other sections of the paper deal with technique and characterology.

ALFRED CARVER.

### PSYCHOPATHOLOGY.

[38] A psycho-analytical study of Edgar Allan Poe.—LOVINE PRUETTE.  
*Amer. Jour. Insan.*, 1920, xxxi, 370.

AN interesting history of Poe's life experiences and personal characteristics is given, though the data concerning his early life are somewhat scanty and conflicting. The family heredity showed much taint, while a decided organ inferiority and the brain lesion he suffered from in later life may have been the result of syphilitic infection or apoplexy, or caused by an inherited inferior brain for which his genius may have been an over-compensation. An early event had a powerful effect upon his imagination, so that at an early age the subjects of death, love, and beauty, which possessed his mind so much in after years, dawned upon him. Neurotic traits were not long in being shown. He evinced much introversion, and became addicted to alcohol, while his being an only child, and being adopted on the death of his parents and having a hard struggle for the bare necessities of life, all enhanced his inhibitions to make the necessary adjustments to reality. His poems reveal his want of satisfaction with his world and his regressive tendencies. His love life demonstrated a mother fixation, and he always wished to be loved rather than to love. The heroes he portrays are autobiographical, are melancholy, neurotic, hypochondriac, and monomaniac, and he seems to have had some insight into his abnormal nature. Through his experiences, sexual and otherwise, the basis themes in his writings can be traced: the death of beautiful women, the linking of death with sex, the grave or tomb, and sadistic delight in torture. An obvious death-wish is seen in many of his stories, and analysis shows that the detailed setting forth of lack of reason given for a murder indicates a defence mechanism against the unconscious wishes. The feeling that the dead are not wholly dead can be traced to a projection of his feelings of remorse for his death-wish. Symbols of death and sex are also found in the colours he freely uses in his text. A masochistic tendency is well displayed by Poe in a few stories. The tale of "The Pit and the Pendulum" best of all illustrates this, but in the "Gold Bug" the solving of the cipher represents the delight of a mind which loved to torture itself.

C. STANFORD READ.

- [39] Unconscious motives underlying the personalities of great statesmen, and their relation to epoch-making events. (I. A psychological study of Abraham Lincoln.)—L. PIERCE CLARK. *Psycho-analytic Rev.*, 1921, viii, 1.

IN this psycho-analytic study light is thrown upon the basal origins of Lincoln's periodic depressions, from which he was a lifelong sufferer. The progressive symptomatology of such depressions is briefly dwelt on, and in the discussion on etiology and pathology Clark accepts and gives in outline the hypothesis of Hoch, who studied such cases much in the light of Freudian psychology. This mainly centres round a defective adaptation, especially in the sexual sphere, arising from a repressed and unconscious infantile sexual attachment to the parent of the opposite sex. In the severest forms of melancholia the longing is often expressed as a wish to die and be with the mother, or the wish for removal of the other parent, as shown in the delusion that the father is dead. A man may become neurotic when he becomes engaged, as Lincoln did. The main facts of Lincoln's life are then sketched out, and it is noted what bearing the above hypothesis has in the interpretation of his depressive episodes. It is thus seen how his parental affective relations formed a basis for his future abnormalities, how he was rather reserved and cold towards the opposite sex, and how the early death of his first wife produced a profound depression which was followed by like periodic states. It was soon found through a second engagement and marriage that he was unable to adapt himself to such situations, because the mother love stood in his way. It is surmised that Lincoln's strivings to lessen the power of authority and dominance of the Church were promoted by his denial of his earthly father's domination. After the first great emotional crisis of his favourite son's death, he accepted a religious outlet as a means of unconsciously solving or sublimating a large part of his regressive relations with life which had heretofore taken the form of intensive and prolonged depressions.

C. STANFORD READ.

- [40] The mental hygiene of industry.—MARY C. JARRETT. *Mental Hygiene*, 1920, iv, 867.

THIS is an inspiring paper dealing with the application of the methods of mental hygiene to the industrial worker, and, in the form of a report of the progress of the work undertaken under the engineering foundation of New York, it shows from a very practical point of view the nature and scope of the work that can be done, and by how much the efficiency of the industrial machinery can be enhanced. Three groups of members of industrial communities are recognized: (1) A small but potentially important group of mentally-diseased employees; (2) A large group of individuals, possibly nearly half of the working force, whose mental character is such as to demand special consideration; (3) The largest group of workers, possibly a little over half, who have no appreciable mental difficulties and whose problem is chiefly to develop their mental capabilities. Very often it was found that the best workmen were to be included in the second group, and the most common problem was in regard to the question of how to keep them at their work.

Many illustrations are given of individual cases which have actually been dealt with, and of these the following may be given as an example: "Girl who could concentrate only until an early hour of the afternoon. Every few weeks she would get wild and leave her work, saying that she could not stand it another moment. Her problem was solved by putting her on two different jobs and changing her work every day at noon".

The paper refers to the writings and publications of many psychiatrists interested in the subject, and concludes with the statement that there is likely to be a demand for a large number of psychiatric social workers trained in the general technique of social investigation and treatment and the special technique of personality study.

THOMAS BEATON.

- [41] Medical and social aspects of childhood delinquency.—SANGER BROWN. II. *Amer. Jour. Insan.*, 1921, lxxvii, 365.

THE conclusions here found are the result of a study of this problem in a probationary school by a physician, a psychologist, and a social worker appointed by the National Committee for Mental Hygiene. The misdemeanours of the 200 boys were commonly those of truancy, petty thieving, gambling, disobedience, and what may be termed an antisocial attitude of mind was frequently developed. Are such troubles due to an abnormal physical condition? Does the disorder rest in the mental sphere, possibly on a basis of mental deficiency? Is the disorder one of personality more than one of actual mental defect? Is the environment to blame? Do definite mental conflicts bring about the delinquency? These points are discussed. Though it is difficult to group the causes of delinquency under general headings, it is possible to some extent to do so. (1) A fair number show a psychic nervousness which is the basis of their maladjustment, and this was often found to be aided by such physical causes as malnutrition and overwork. (2) A considerable proportion are mentally deficient, so that mental maladjustments are more prone to be engendered. (3) Some evince certain characteristic personal traits which often make it difficult for the child to get along unassisted in the ordinary surroundings. (4) There are the cases which are the product of the environment itself.

The treatment and management of delinquency are then briefly sketched out. A thorough examination of the boy himself must be the first step: but in the majority of instances the social and environmental problems are the more important. A separate school should be made use of, and in many cases a change in respect to home and neighbourhood is needed to meet the situation. With a broader understanding of these problems important advances may be made.

C. STANFORD READ.

- [42] Disorders of symbolic thinking and expression.—HENRY HEAD. *Brit. Jour. Psychol. (Gen. Sect.)*, 1921, xi, 2.

THIS paper is based upon studies published in *Brain*, 1920, vol. xliii, 2, where the author recorded his methods and results of investigations into the effects of unilateral lesions of the brain affecting the use of language.

He further discussed the subject in the Hughlings Jackson Lecture for 1920 (*Proc. Roy. Soc. Med.*, vol. xiv). The research is particularly welcome in that aphasia has been one of the most chaotic subjects in the whole realm of neurology. Previous investigations into disorders of speech have been vitiated by the assumption that speech was a well-defined function having a strictly localized site in the brain. Head shows that speech was from the first concerned with expressing relations. The functions which may suffer in aphasia are numerous, and are affected in varying degree in different cases. Words, numbers, pictures, and every act which depends upon the use of these symbols in constructive thought may be affected, but it is symbols used in a particular manner which are affected, and not all symbolic representations. The more nearly a symbolic action approximates to a frank proposition, the greater difficulty does it present to the aphasic.

Head distinguishes the following groups according to the most salient defect, but states explicitly that this grouping is for convenience only, and must not be taken as defining any specific psychic function. Verbal defects: The disorder affects mainly verbal structure and words as integral parts of a phrase, their nominal value and significance being perfect. Syntactical defects: The disorder is one of balance, and the patient is ataxic in his speech: although he has plenty of words he talks jargon. Nominal defects: A loss of meaning of words and other symbols: reading and writing and drawing a plan are extremely difficult. Semantic defects: A lack of recognition of the full significance of words and phrases apart from their verbal meaning: the loss is of meaning in thought, and seriously interferes with the activities of daily life. The research shows that: (1) No lesion, however local, can affect speech and speech only, and conversely there is no single psychological function corresponding to speech: (2) The manifestations of aphasia cannot be explained as due to destruction of sensory images, for these may remain intact even though they cannot be used voluntarily as part of the symbolic mechanism of language: (3) Suitable lesions of the brain may separate the two aspects of meaning inherent in the use of symbols—i.e., the particular meaning of words (nominal defect) from general meaning in thought (semantic defect).

ALFRED CARVER.

[43] Religion in the light of psycho-analysis.—CAVENDISH MOXON. *Psycho-analytic Rev.*, 1921, viii, 92.

RELIGIOUS belief gives a symbolic satisfaction for hidden impulses, lowly emotions, and primitive ideas, and in order to understand the religious experience it is necessary to study man's strivings for psychophysical pleasure from earliest infancy. The love which is either unconsciously fixed on a parent or unable to find a satisfying parent substitute, seeks various symbolic satisfactions as a compromise. Hence it is at puberty that the need occurs for God as substitute for the father or the grandfather. Religious conversion, therefore, usually happens at this period of great moral repression and psychical advance. God is a product of the unconscious desire for a parental authority. Parental love is symbolized



by the loving Father God in religions that express the reaction of conscious civilized piety against infantile hate. Both the sadistic and masochistic components of love are satisfied by religious doctrine. God is kind and cruel. The fear that stimulates modern religious faith is a complex dread of life and its tasks as a whole, and so religion may be viewed as a psychical flight from a dark and threatening reality—a safety-valve for the strained mind. Old age is specially prone to religious relapse, from the weakening of higher control and increased longing for peace. Religion is consequently regarded as a retrograde phenomenon, and is a strong temptation when no attractive or safe outlet for energy appears. Belief is a product of displaced, projected, and personified love force. This is unnecessary where full satisfaction is found directly in marriage and indirectly in social service.

C. STANFORD READ.

[14] The revival of emotional memories and its therapeutic value.  
A symposium. *Brit. Jour. Psychol. (Med. Sect.)*, 1920, i, 16.

WILLIAM BROWN states, as a result of his experience, that the revival with hallucinatory vividness of 'forgotten' emotionally-toned memories is the important factor in causing the disappearance of psychoneurotic symptoms, the essential thing being the revival and abreaction of the emotion accompanying the memory. This implies that the emotion associated with the memory has been pent up, and that its abreaction rather than the abolition of the amnesia is the prime factor in the restoration of the patient. Brown suggests that in the production of the symptoms a twofold dissociation takes place. First, the shock produces a dissociation from personal consciousness of certain psychophysical functions, together with the memories linked with them immediately after the shock—this has to do with the sensorimotor system. Secondly, a dissociation between the psychophysical and physical counterparts of the emotional reaction—this has to do with the sympathetic system. Both dissociations are abolished by revival, with hallucinatory vividness, of the emotion. He seems to consider that the great value of what he terms 'autognosis' lies in withdrawing emotional over-emphasis from 'forgotten' memories: emotional over-emphasis being responsible for the relative autonomy of those memories. Yet 'autognosis' is no mere mechanical abreaction. In it abreaction is controlled intellectually step by step.

C. S. MYERS disagrees with Brown's view that the revival of *emotional expression* is the important factor. In Myers' experience what is of importance is the revival of the unpleasant memory of the event i.e., the revival of the dissociated affective and cognitive experience. Myers, therefore, deliberately discourages undue prominence of emotional expression during treatment. He insists on the distinction between emotional feeling and emotional expression, and doubts whether increase of the latter implies increase of the former. It is not the emotional but the unpleasant (affective-cognitive) aspect of experiences which is repressed. What, therefore, is of value in 'autognosis' is the relieving of affective-cognitive repression and the reintegration of dissociated components—not, as Brown would have it, the abreaction of pent-up emotional over-emphasis.



W. McDougall considers that the abreaction hypothesis implies the existence of packets of explosive energy attached to ideas. This smacks of the old theory of ideas as entities capable of being stored in the mind, and it leads to the same difficulties and confusions. If, however, this assumption be put aside, it is difficult to see how the revival of an emotional experience can afford relief. On the contrary, one would expect it to accentuate the trouble, as indeed actually is the case under certain circumstances. The essential element in recovery is the abolition of amnesia, and any display of emotional excitement which may accompany this process is only of value in rendering the recollection more complete in detail. McDougall then puts forward a physiological schema to illustrate how cognitive processes may become dissociated from one another while retaining their connection with affective dispositions, which latter, far from being thrown out of action, are kept unduly active thereby. The value of what Brown terms autognosis consists in the reintegration of dissociated cognitive elements—not in abreaction of stored-up emotion.

WM. BROWN, in reply, agrees with a great deal that his critics have urged, but considers Myers' distinction between affect and emotion to be an artificial one. He suggests that the reinstatement of intense emotion acts physically by overcoming synaptic resistances, and claims that McDougall really assumes the process of abreaction as a *vera causa* of reintegration in the very schema wherein he seeks to discredit it. Finally, Brown would enlarge the scope of his term 'autognosis' to make it include all the factors at work in psychotherapy.

ALFRED CARVER.

[45] The pathogenesis of epilepsy.—C. STANFORD READ, *Brit. Jour. Psychol. (Med. Sect.)*, 1920, i. 72.

THIS contribution is mainly devoted to a survey of the clinical studies of Pierce Clark, published in various journals between 1908 and 1918. Clark, as the result of an intensive and painstaking study of the epileptic mentality, has arrived at two fundamental conclusions. First, that those individuals who later develop essential epilepsy invariably present a special mental make-up characterized by hypersensitiveness and egocentricity which render them incapable of social adaptation; the study of the epileptic in his interparoxysmal periods—a thing previously neglected—thus becomes a matter of importance prophylactically, diagnostically, and therapeutically. Secondly, the epileptic's inability to inhibit his egotistical trends results in his evasion of the difficulties by a withdrawal from the exacting environment—this constitutes the fit. Following a suggestion of Ferenczi, Clark regards the fit as a psychological regression to the *mutter lieb*, a metro-erotism. Although this on first consideration may seem fantastic, it is supported by the attitudes (Kempf's postural tensions) assumed by advanced epileptics. Clark considers that somatic defects, when present, are only contributory to the production of the fit, the essential fault being a psychobiological defect. He illustrates his thesis by many excellent case histories, one of which is quoted as an example by Read. Clark, by analyses begun in the disorientated state following a convulsion, concludes that the conflicts of epileptics are particularly crass.

In the first stage of a fit the stress precipitating it alone may be uncovered; but whenever a deeper level of unconsciousness is reached an easily recognizable sexual striving is revealed. As a result of his studies Clark makes some useful therapeutic suggestions and enters into the whole problem of the management of epileptics. Though a complete change of make-up cannot be brought about, a great deal may be effected in early cases by appropriate methods of mental training combined with physical therapy.

Read, who has himself added to our knowledge of the subject (*Jour. Abnorm. Psychol.*, 1918, vol. xiii, No. 1), is full of admiration for Clark's work, and deplores the prevalent attitude of neurologists to regard all their material from the neuronic mal-functioning point of view and to look askance at psychobiological interpretations.

ALFRED CARVER.

[16] The psychogenesis of a case of female homosexuality.—SIGMUND FREUD. *Internat. Jour. of Psycho-analysis*, 1920, ii, 125.

THE patient, a beautiful and clever girl of 18, had passed through the normal stage of the feminine Œdipus-complex, and had later begun to replace her father by a brother slightly older than herself. No early sexual traumata were disclosed by the analysis. About the age of 13 her libido was focused on motherhood; after this and until she was 16 years of age her sexuality was definitely of a bisexual nature. On the birth of her third brother, when she was about 16, she became a homosexual attracted to mature women. The explanation of this change is as follows: At the birth of her brother the girl was experiencing the revival of the infantile Œdipus-complex so common at puberty. She was conscious of the wish to have a male child; that it was to be from her father, and in his image, her consciousness was not allowed to know. Exasperated that it was not she who bore the child, but the unconscious hated rival, her mother, she turned away from her father and men altogether, and sought another goal for her libido—compare the action of some men who have been 'jilted'. She changed into a man, and took her mother (her relations to her had always been ambivalent) in place of her father as her love-object. As this love-object was unsatisfactory she sought for a mother-substitute to whom she could become passionately attached. There was another motive for her change to homosexuality. Freud calls it the 'advantage of illness'. The mother, who was rather harsh with the patient, still valued the admiration of men. If, then, the girl became homosexual and left the men to her mother, she removed a source of her mother's disfavour. The inversion was reinforced when the patient realized that she could hurt her father, who was very bitter when she made no attempt to hide her love for a woman whose reputation was unsavoury. The final reinforcement came when she found in this 'lady' an object which promised to satisfy not only her homosexual tendency, but also that part of her heterosexual libido still attached to her brother—this lady resembling him physically in some ways. The patient made a suicidal attempt by flinging herself on to a railway cutting immediately

after her father expressed his displeasure when he met her walking with this woman. This attempt was determined by two factors: a 'punishment fulfilment' (self-punishment) and a 'wish fulfilment'. The latter signified the attainment of the wish to have a child by her father: she 'fell' through her father's fault. The girl's action proved that she had developed in her unconscious strong death-wishes against one or other of her parents. Freud considers it probable that no one attempts to kill himself unless, in the first place, he in doing so is at the same time killing an object with whom he has identified himself, and, in the second place, is turning against himself a death-wish which had been directed against someone else.

The case for various reasons was not a favourable one for psycho-analytic treatment. The removal of homosexuality is never a hopeful matter; success consists in being able to open to the restricted homosexuals the way to the opposite sex, till then barred, thus restoring their full bisexual function. Other kinds of reaction to the Oedipus attitude at puberty are probably more common than homosexuality. Psycho-analytic investigations reveal two fundamental facts: (1) That homosexual men have experienced a specially strong mother fixation; (2) In addition to their manifest heterosexuality, a very considerable measure of latent or unconscious heterosexuality can be detected in all normal people.

Many interesting points are dwelt upon which it is not possible to reproduce in an abstract of this length.

C. W. FORSYTH.

[17] **Sadism and masochism.**—W. REES THOMAS. *Jour. of Ment. Sci.*, 1921, lxvii, 12.

DEFINING sadism as including anything from an impetuous attitude towards the sexual object to the complete subjection and ill-treatment of the sexual victim, and masochism as including anything from mere subjection to the sexual object to the suffering of pain as a condition of sexual gratification, the author proceeds to show the widespread occurrence of these two impulses as evinced in an abnormal manner in the behaviour of a revolutionary mob, of the audience of a bull-fight, in the convention of marriage by capture, etc., and sees their normal counterpart in the masterly attitude of the male and the subjection of the female.

Pain is conceived as a form of intense emotional excitement; but to the child it is experienced as a direct negation of the sense of power; consequently cruel behaviour or the infliction of pain on others is, to the child, a means of maintaining the satisfaction of omnipotence. This behaviour is only inhibited by the later development of the secondary impulse of sympathy, and, until this later development occurs, there is the danger that the connections between cruelty and the erotogenous impulses formed during early life may not be broken.

The author then indicates the association between muscular activity and the sexual feelings, and shows how the cruelty impulse can acquire force from the child's too close association with the intimate life of the

parents. He passes to discuss the sadistic anal erotic fixation and the sadistic oral or cannibalistic erotic fixation, the latter of which finds its adult expression in the feeling described by the lover when he says of his loved one, "I could eat her". Reference is made to the source of the passive cruelty impulse to be found in the sexual excitement associated with irritation of the skin of the gluteal region, and, in relation to this, to Freud's observation on the sexually-exciting influence of some painful affects, such as fear or horror.

Two other tendencies are mentioned as showing cruelty components—exhibitionism and sexual curiosity—in the former the active impulse being seen in the desire to give offence, the passive element in the desire to acquire a reputation and the submission inferred. Freud's opinion, that masochism possibly arises from sadism through repression, is given, and the author concludes with the contention that active and passive cruelty may be recognized as almost universal, and that the tendencies act in greater or less degree in influencing and colouring the sexual abnormalities and psychoses.

THOMAS BEATON.

[48] **Homosexuality.**—C. STANFORD READ. *Jour. of Ment. Sci.*, 1921, lxxii, 8.

THE author emphasizes the importance both to the sociologist and the psychiatrist of attaining a full understanding of the homosexual perversion, and deprecates the tendency to regard the perversions as merely disgusting and therefore not worthy of study. He differentiates between the active and the passive perverts: the former are few in number and developmentally abnormal, while the latter are numerous and have acquired the tendency: their condition, therefore, he regards as a neurosis.

Dr. Read then expounds the Freudian teaching in regard to the fixation of the homosexual element as an outlet for the libido in the passage of the child through the narcissistic stage of mental growth, and proceeds to show how this persistent homosexual tendency may be dealt with by the personality in adult life. He considers that there are four possibilities: (1) The desire may be little in conflict with the personality, and then gratification would occur with or without subsequent self-reproach; (2) Repression may be successful, and the conflict will then end with a resumption of heterosexual relations; (3) The energy of the impulse may be sublimated into useful social channels; and lastly (4) In the predisposed, the conflict may result in a mental disorder.

Paranoia has been shown by Freud to be a development associated with the latent homosexual tendency, and it is possible that, by analogy, certain minor paranoid states are to be explained in the same way: hence the author has put forward the hypothesis that the frequency of the paranoid states during the late war was due to the arousing of a latent homosexuality in many previously heterosexual individuals by the herding together of vast numbers of men which occurred during the period of hostilities. The delusional state of the paranoiac is regarded by the Freudian school as an attempt at a biological reconstruction, and is reached by the

use of the mechanism of projection to repair the failure of adaptation, the chain of reasoning being, in the case of the delusions of persecution, "I love the man", negated, because unbearable, to "I do not love the man", and finally projected to "He hates me".

The author then deals with the relationship between the psychological state of the alcoholic and that of the paranoiac. He remarks that the common sexual content of the hallucinosis in both conditions has long been noted, and that the basic psychological association of the two states is quite apparent from the Freudian interpretation. The latent homosexual pervert seeks relief from his conflict in alcohol, which drug so operates as to destroy sublimation and to favour regression as a means of attaining adaptation; the paranoid state then results by the mechanism outlined above.

THOMAS BEATON.



## Reviews.

*The Logic of the Unconscious Mind.* By M. K. BRADBY. Svo. Pp. 316. 1920. London: Henry Frowde and Hodder & Stoughton. Oxford: University Press. 16s. net.

WITH engaging frankness Miss Bradby confesses in her preface that she is unable to understand most books on philosophy. The wide range of her knowledge which this volume reveals will probably lead the reader to be sceptical as to this; but the contents make it clear that Miss Bradby's interests and sympathies are so deeply concerned with struggling humanity and the press of life, that she would obviously have but little leisure to devote to detached philosophic speculations. The book deals with vital social problems of the day, and it has a much more practical aim than its title would suggest. At the outset it is made clear that the modern logician is not so much concerned with formal logic as with the 'machine' which "turns out faulty coins" (p. 15). Attention is drawn to the notable "contrast between the purpose and achievement of human society" (p. viii), and the suggestion is made that the failures of civilization are partly due to defective logic. The purpose of this book is thus to indicate the personality factors responsible for the inconsistencies which are apparent in so many directions.

Part I is concerned with the psychological principles upon which the views developed in this volume are based. The relation of reason and intelligence to intuition and instinct are first indicated. It is shown that "reason does not supply a motive to action, it does not set us going, though each and every motive which actuates us sets reason going (p. 29) . . . Reason emerges from a background of instinct and intuition (p. 46)." Considerations along these lines lead to the question of "Dreams and Unconscious Symbolism", a subject which enables Miss Bradby to develop her fundamental thesis. This is to the effect that the function of reason is operative at all levels of mental development. "Reason is present in the unconscious mind. . . . Rules of logic are not . . . contradicted in the unconscious . . . but merely applied to less developed material. . . . All logic is one, that of rational mind continually developing. The laws of a growing plant hold good of all its stages (p. 47). . . . The typical myth or fairy tale expresses subjective truth; the scientific observation expresses objective truth; and both are equally logical" (p. 61). The section concludes with a study of language in relation to the structure and development of thought.

Part II is included under the heading of "Unconscious Motives the Source of Fallacy", a title which indicates the line of thought which Miss

Bradby pursues. Her argument is best indicated by a few quotations from the book itself. "The logical aim has three aspects: to act effectively, to feel justly, and to think logically. In each case the mental act is logically valid when subjective elements bear a certain ratio to each other. . . . Observation, argument, emotion, and conduct are all illogical when the subjective element does not tally with the objective." This failure in proportion arises when "thought, feeling, and action are disproportionately subjective because of unconscious traits which remain unrecognized by the conscious self" (p. 95). "Unconscious factors producing fallacy . . . are not fallacious in their proper sphere, but only when they operate in consciousness without becoming harmonized; They are modes of thought proper to dream life, thrust into waking life; emotions and desires belonging to a more primitive personality unconsciously determining conduct; old wine in new bottles" (p. 98).

With such psychological principles as a background, Miss Bradby proceeds to examine some typical instances of illogical conduct and to gauge the unconscious motives which she assumes to underlie them, and in subsequent chapters she gives an excellent analysis and classification of a number of characteristic fallacies.

Up to this point, then, the writer shows in her own original fashion the influence of emotional factors and unconscious trends in the development of opinions and attitudes. Having shown what is wrong with people, she proceeds, in Part III, to suggest the remedy. She here discusses a number of highly controversial topics such as progress, good and evil, religion, immortality, education, the drink problem, and prostitution. These questions are somewhat outside the scope of psychology, and it is inevitable that their discussion within such a short compass should be somewhat superficial and at times unconvincing, as, for instance, when Miss Bradby expresses the view in regard to prostitution that "the problem is chiefly how to cure a neurotic habit, and above all to prevent its manifestations in childhood and youth" (p. 240).

The writer reveals herself as a strong believer in human progress. "Humanity", she writes, "fights a winning battle. Great as are the forces of the enemies of progress, who can doubt that they are weaker to-day than ever before in the history of the world?" (p. ix). Many eminent people do of course doubt this: but such reasoned optimism is welcome at a time when there is much that would seem to discourage such a view. We are inclined to think, however, that Miss Bradby somewhat overestimates the part which self-realization will play in accelerating this progress, and that her enthusiasm for the 'new psychology' leads her at times to express views with which it is difficult to agree. Thus, in discussing the educational methods of the future, she writes, "Accordingly the teacher will encourage his pupils to observe and study their dreams at night wherein each may discover his own habitual tendencies, the sort of subjective story, or situation, which is constantly being woven, and projected on the objects of waking experience, by the mind at its unconscious levels" (p. 206). The picture which this suggestion arouses of a school peopled by little psychopathologists is far from representing what

one would wish children to be. Apart from the fact that Miss Bradby's views as to the psychology of dreams have by no means passed beyond the region of debate, it is an extremely moot point whether the encouragement of dream analysis as a general habit is desirable in the interests of mental health, though its value for therapeutic or scientific purposes is no doubt considerable. We do not indulge in a laparotomy unless there is something the matter.

Miss Bradby covers such a wide range of debateable subjects that criticisms such as the above naturally suggest themselves. We can, nevertheless, cordially recommend her book. She has an ingenious and fertile mind, and she strikes out an original line of her own. She has written a readable, interesting, and suggestive book. She has, moreover, the most commendable habit of always providing examples—and excellent ones it may be said—to emphasize the points which she wishes to make; as, for instance, that of the lady who dreamt that she "turned into a tablecloth to escape from someone who insisted that she should do pioneer work" (p. 51). From which it would appear that the unconscious has a certain dry humour of its own: and there would, after all, seem to be no particular reason why this should not be the case. The amusement which patients with dementia præcox so often derive from their hallucinatory experiences would seem to favour such a view.

H. DEVINE.

**Nerves and the Man: A Popular Psychological and Constructive Study of Nervous Breakdown.** By W. C. LOOSMORE, M.A.  
Cr. 8vo. Pp. 224. 1920. London: John Murray. 6s. net.

THE author writes as one who "himself knows what nervous breakdown is", and who now publishes his experience in the hope of helping others who unhappily know it. Perhaps this is merely a literary artifice: at any rate he spares us the details of his case. To nervy people in search of advice—and we all like to listen to it sometimes, especially if it is impersonal—his book may be commended: they will find plenty of it here, for much of what he has to say is cast in that form. But the excellence of his book does not lie merely or mainly in the excellence of the advice it contains. Not only, for instance, does he properly deprecate introspection, but—what is more to the purpose—he directs his readers' attention in practical ways to outside things. So, from such matters as the importance of chewing one's food, or measures for the combating of insomnia, we are quickly led to more alluring topics—the pleasures of the garden, the art of listening to music, the choice of books, the sweet influences of religion—and long before nearing the end we have ceased to consider seriously what special value his recommendations may have for nervy people, our attention being taken up rather by the general interest of the subjects he raises. This is as it should be, and is a main reason why his pleasant and temperately written homily should be useful to those to whom it is principally addressed.

SYDNEY J. COLE.

*Innere Secretion und Dementia præcox* (The Rôle of Internal Secretions in Dementia Præcox). By OSCAR LESSING. Large 8vo. Pp. 64. 1921. Berlin: S. Karger. M. 4.

THE author of this monograph insists upon the need for the investigation of the rôle played by internal secretions in the whole province of medicine, and especially in psychiatry. He traces historically the course of thought which has gradually developed in our views regarding the etiology of insanity, from the early conception of diabolic possession to the present day, when the latest tendency is to seek the etiology of mental aberration in disorders of internal secretion.

The author considers dementia præcox more from the psychological than from the psychiatric point of view, and insists that the three recognized forms are not strongly demarcated from one another. He therefore prefers the term schizophrenia, the predominant symptom always being a weakening and splitting of the personality. He draws attention to the psychic disturbances which occur in diseases such as Graves' disease, myxædema, acromegaly, etc., which are known to depend upon disorders of endocrine glands, and also to the psychic changes noticeable in the various eunuchoid conditions. It is significant that the age of onset of the psychosis is puberty, when certain glands—thymus and pineal—are undergoing involution, while others—thyroid and pituitary—are coming to play an increased rôle in internal economy, and the genital glands are undergoing an enormous development, with which is correlated an altered psychical reaction. Thus schizophrenia appears to him as the result of a more or less firmly established disturbance of the whole endocrine system. This disturbance shows itself somatically in many ways, which are discussed in some detail. Animal experiments being inadmissible, an experimental basis for the relationship between endocrine disorders and dementia præcox is sought by: (1) 'Pharmacological analysis'; this is practically a quest for Jung's X toxin and yields only indirect results. (2) 'Serological analysis'; this is an application of Abderhalden's work as elaborated by Loeb, Maas, and Fauser, but while demonstrating that altered activity of the endocrine glands plays a part in the total picture of the psychosis, it fails to indicate precisely what this part may be. (3) 'Organotherapeutic analysis': under this heading comes the successful treatment of cases of dementia præcox by means of glandular preparations, especially thyroid extract. The author considers that it is not so much hypofunction as 'dysfunction' of the endocrine gland which is to blame. But in addition to dysfunction there is a loss of the normal balance in the system. Finally, he puts forward the suggestion that both dysfunction and loss of balance in the endocrine system may be found ultimately to depend upon a disturbance of the vegetative nervous system which regulates the activity of all internally secreting organs. It is regrettable that references to the literature bearing upon the subject are scanty, and one misses in particular any mention of Sir Frederick Mott's work.

ALFRED CARVER.

**Die Schlafstörungen und ihre Behandlung** (Disorders of Sleep and their Treatment). By DR. L. E. BREGMAN. Large 8vo. Pp. 136. 1920. Berlin: S. Karger. M. 12.

It is surprising how much clinical symptomatology revolves round the question of sleep. Not only are varieties of sleep disorder in a minus direction—sleeplessness of all sorts—to be considered, but also positive or plus defects of the nature of pathological sleepiness, attacks of sleep, narcolepsy, and persistence of continuous sleeping. These and various other clinical phenomena connected with the subject receive full consideration in Dr. Bregman's slender volume, which is as complete on the side of treatment as it appears to be on that of symptomatology. The etiology of sleeplessness is considered at some length, but we miss any reference to the question of normal sleep, and cannot help feeling that in a monograph of this sort some consideration might have been given to this theoretical aspect, in view of its obvious bearing on the pathology of sleep. There is a useful chapter on the treatment of insomnia by psychotherapy, and an appendix containing a list of the best-known hypnotics, with clinical notes. The physical treatment of insomnia is, however, not neglected, and we welcome the author's general contention that physical methods should not be ignored or drug methods thoughtlessly adopted. The value of this little monograph is increased by many references to the literature and by the general all-round approach to the subject which the author makes.

**The New Psychology and its Relation to Life.** By A. G. TANSLEY. Pp. 283. 1920. London: George Allen & Unwin, Ltd. New York: Dodd, Mead & Co. 10s. 6d. net.

In this volume Mr. Tansley endeavours to give the general reader an account of the structure and working of the human mind from the point of view of the more recent psychological developments. The book is very readable, and contains many observations of interest and value; though possibly it assumes more knowledge on the part of the general reader than he can reasonably be supposed to have, and it is thus perhaps more suitable for the informed student of psychology. In the introductory chapters Mr. Tansley explains and defends the dualist conception which he adopts in dealing with his subject, and throughout his book he treats mind as an independent entity with its own laws, energy, and phenomena. While there is much to be said for the point of view which detaches mind from its setting in the physical organization, it also has serious disadvantages which cannot be ignored, and in some respects Mr. Tansley's treatment of his subject brings these into strong relief. Especially is this apparent in the chapter on psychic energy and the libido, where the author makes assertions with which it is difficult to agree. Thus, in maintaining the necessity for assuming the existence of psychic energy as distinct from physical, Mr. Tansley writes (p. 61): "A navvy driving a pile expends very little psychic energy, but a great deal of physical energy, with each stroke;



whereas a philosopher searching for the right phrase to express a difficult and subtle idea may spend a good deal of psychic energy in the search, but uses very little physical energy in speaking or writing the words. Indeed, if the philosopher is alone, and is content with merely thinking the words, he may spend no physical energy at all—the whole effort is completed with the completion of the mental conation and does not pass over into motor action.” The last sentence in this quotation would seem to be quite untenable, and indicates how impossible it is to maintain consistently an essential difference between thought and action, each having its own particular form of energy. Surely, while the philosopher is thinking, his thought finds expression in a constant discharge of energy through motor channels, as evidenced in the frowns of concentrated thought, subvocal or silent speech, tension of the musculature, and nascent movements which may at any moment issue in explicit activities. Any work, physical or mental, must involve activity on the part of the whole organism and a corresponding expenditure of physical energy. There is at present a strenuous endeavour to regard the organism as a unity in approaching the problems of psychology, and to erect a psychology upon a physiological basis in terms of physical rather than psychical energy, and it may well be that some formula may be suggested which will serve to replace the unsatisfactory dualism with which Mr. Tansley finds himself unable to dispense. Professor Holt has managed to do this with some success in his work *The Freudian Wish*, to which reference is made in this volume, and we rather regret that Mr. Tansley has not found it possible to take a somewhat similar standpoint. We are tempted to make this general criticism of the author's book because, though he modestly conceals the fact, he happens to be a distinguished biologist, and it would, perhaps, have been of greater service to the psychologist if he had approached his subject from the strictly objective and biological attitude that he adopts in his own particular branch of science. As it is, he erects an extremely complex and rather vague hypothesis of the unconscious which differs in structure from that formulated by Freud upon grounds which do not appear to be well justified.

The author provides a comprehensive survey of his subject, and approaches it under the successive headings of The Structure of the Mind; The Energy of the Mind; By-ways of the Libido; Reason and Rationalization; and The Contents of the Mind. He does not adhere strictly to any particular school of thought, but bases his views on the teachings of McDougall, Trotter, Freud, Jung, and Hart. Altogether he has written a book which contains much of interest to the psychologist.

II. DEVINE.

**In Search of the Soul. The Mechanism of Thought, Emotion, and Conduct.** By BERNARD HOLLANDER, M.D. Vol. I, pp. 516; Vol. II, pp. 361. London: Kegan Paul, Trench, Trübner & Co., Ltd. £2 2s.

WHEN Dr. Hollander set out on his 'search' he undertook a colossal task—one which would have seemed great even to a number of collaborators.

Yet he has succeeded alone in giving a conspectus of the theories as to soul or mind from the earliest times onwards, and also a history of research into the structure and functions of the nervous system. Then, having gathered his materials together, he has attempted to elaborate them into a system—to localize the mental functions and to synthesize the attributes of mind into an ethology or scientific exposition of the bases of human conduct. Dr. Hollander would be the first to admit that no satisfactory solution of *all* the problems can yet be found: but it is no inconsiderable achievement to have cleared the ground for future workers.

It may be well to note in passing that though the title may be misleading to some who may infer that this book is more theological than medical, it is not "a mystical or speculative work . . . but a strictly scientific treatise". Religion is only introduced incidentally, as, for example, where the author deals with primitive religious systems; or when he records—quite justifiably—the manner in which scientific thinkers—or heretics, for the terms are practically synonymous—were dealt with by the particular orthodoxy which happened to be in power at the time.

The first volume is chiefly historical. The various systems of philosophy are succinctly described, and there is a running commentary of acute criticism. Not only, however, are the theories as to normal mental processes set out in clear and direct language—no easy matter in itself—but morbid psychology and the investigation of pathological changes are dealt with concurrently. It is safe to say that never before have these matters been so adequately discussed in conjunction one with the other. As a history of the treatment of the insane it is of great value. A large part of the first volume is given up to a summary of the life and work of Francis Joseph Gall, of whom Dr. Hollander is the accredited champion. It may be said that too much space is allotted to Gall and to a discussion of the various objections to his conclusions. On the other hand, the author makes it quite clear yet once again that Gall was a great man who devoted much time to patient research, and was so far ahead of his own generation that he was inevitably doomed to obloquy. Because of certain tentative theories as to the localization of mental attributes—theories exploited and given an undue proportion by less instructed and possibly less honest followers—Gall was dubbed a phrenologist and treated with scorn and disdain. In spite of this, his suggestions as to localization in cerebral function have been adopted even by people who would scorn to admit that they were followers of Gall! This is made sufficiently clear by Dr. Hollander in the résumé he gives of the work done on cerebral localization down to the present time: for example, by Broca, Dejerine, Pierre Marie, Hughlings Jackson, Ferrier, Horsley, and others.

In the second volume the author deals with the mental organization of man, ethology, or the scientific study of character—a term suggested by J. S. Mill,—genius, insanity and crime, the power of suggestion, and the history and results of hypnotism. As will be seen, it is impossible to do more than refer briefly to such a variety of subjects. Dr. Hollander brings forward here, as in his former book, *The Mental Functions of the Brain*, evidence in support of the localization of such functions. Apart from any

prejudice we may have in the matter, the accumulation of clinical data is of inestimable value.

It is the fashion to depreciate Herbert Spencer; but the time may yet come when his words as to differentiation and specialization, even in the matter of the cerebral cortex, will be gratefully recalled. Whether, as the author remarks, it is yet possible to prove that "the purely intellectual functions . . . are confined to the frontal, or rather the prefrontal, region of the cortex", is a point that will probably be argued for years to come.

The contents of the second volume are more theoretical than those of the first. Yet here, too, is the record of a wealth of clinical material, and the theorizing is not, therefore, to be dismissed hastily. We live amidst a welter of words as to the 'unconscious'; and thus it is necessary to go warily when speculating about such matters. It is not all quite so clear and self-evident as some dogmatic teachers would have us believe. But Dr. Hollander, without dogmatism, has carefully endeavoured to work out the hidden springs of character, those elementary subconscious impulses which were in existence long before the efflorescence we call consciousness.

It would be easy enough, perhaps, to cavil at what is omitted and at the inconclusiveness of the 'search'. As to the first, one is more inclined to wonder at the extraordinary accumulation of material by the author in his encyclopædic work; and as to the second it is, as he admits, inherent in the nature of the subject—at least in so far as our limited knowledge allows us to see at the present time.

It is to be regretted it has been found necessary to use so small a type; but this has been entailed doubtless by the lamentably high cost of producing books in these days. There should have been three volumes of a lordly type as a fitting monument to the energy expended! However, the type is clear; and the value of the book is greatly added to by the excellent indices—of names and of subjects.

HUBERT J. NORMAN.

**The Form and Functions of the Central Nervous System.** By FREDERICK TILNEY, M.D., Professor of Neurology, Columbia University, and HENRY ALSOP RILEY, M.D., Associate in Neurology, Columbia University. Imp. 8vo. Pp. 1020. With 763 illustrations. 1921. New York: Paul B. Hoeber. \$12.

IN this work, which is described as being an introduction to the study of nervous diseases, the authors present a complete epitome of the embryology, anatomy, and physiology of the nervous system, together with chapters at the end of each division illustrating its application to clinical problems of neurology.

Thus, for instance, the pons Varolii is discussed in a series of three chapters, the first dealing with its significance, anatomy, and embryology; the second with its internal structure and histology; the last

describing its functions and principal syndromes. The cerebrum, mid-brain, cerebellum, and spinal cord are dealt with on similar lines. The book is profusely illustrated, and for this purpose not only has judicious selection been made from other works, but the authors have included numerous photographic reproductions of preparations made in their own laboratories. Of these latter the Pal-stained serial sections of the brain-stem are particularly good, and the plan of appending to each section its serial number deserves commendation.

In those parts of the book which are concerned with neuro-physiology one is somewhat surprised to find incorporated as fact such hypotheses as those of Ramsay Hunt as to the functions of the globus pallidus, while subjects of such general clinical importance as decerebrate rigidity, muscle tonus, and the significance of the extensor plantar reflex are neglected. To this last phenomenon the reviewer has been unable to find any reference in the book. It is not mentioned under syndromes due to lesions of the internal capsule, nor is it to be discovered as the result of search in the index under 'reflexes'. Only on p. 816 the 'toe-extension sign of Babinski' is described as an abnormal associated act occurring when the patient is in a recumbent position and flexes the leg and thigh sharply. The omission of an account of the universally accepted sign of Babinski appears curious in a work which deals so widely with clinical phenomena, and in which prominence is given to many functional tests of less widely recognized value.

On the whole, however, the chapters on the various anatomical syndromes are well illustrated by condensed clinical case reports and pathological sections.

On the anatomical side this book as a work of reference fills a gap in English neurological literature. The chapters upon function are less even, and will require revision in later editions.

C. P. S.

**Mental Tests in the American Army.** Compiled and Edited by CLARENCE S. YOAKUM and ROBERT M. YERKES. Cr. 8vo. Pp. xiii + 303. 1920. London: Sidgwick & Jackson, Ltd. 6s. net.

THE importance and value of this little book are out of all proportion to its size. Within the limits of about 300 pages it summarizes the facts and results of a truly colossal scientific enterprise, viz., the measurement of the intelligence of a large proportion of the American Army during the years 1917 and 1918. Various committees appointed by the American Psychological Association, and the Committee for Psychology of the National Research Council, made a combined attack on the problem in the early months of 1917, and later in the year a Division of Psychology was organized within the Medical Department of the army "for the administration of mental tests to enlisted men and commissioned officers" in accordance with the plans that these committees had drawn up. The objects of the mental testing were threefold: (1) To eliminate the mentally incompetent; (2) To classify men according to their mental ability; and



(3) To aid in the selection of candidates for positions of responsibility. The final outcome exceeded initial expectations, and it was found possible to assign to every soldier an 'intelligence rating' on the basis of systematic psychological examination.

Mental tests were devised, or selected from those already in use in applied psychology, of such a nature that they fulfilled the following conditions: (1) Each test should be adaptable for group use for the examining of large numbers rapidly. (2) It should have a high degree of validity as a measure of intelligence. (3) The range of intelligence measured by the tests should be wide; that is, the test should be made difficult enough to measure the higher levels of intelligence and at the same time be an adequate measure of the extremely low levels that would probably be found in the army. (4) As far as possible, it should be arranged for objectivity of scoring and the elimination of personal judgement concerning correct answers: thus the results of scoring in one camp would be strictly comparable with those obtained in another. (5) The test should be so arranged that the scoring could be done rapidly and with the least chance of error. Also, this arrangement should be so simple that relatively inexpert assistance could be used in scoring the large number of papers. (6) There must be either different forms or alternative tests of equal difficulty to prevent coaching. (7) It was necessary also to obtain clues which would enable examiners to detect malingering in connection with the examination. (8) Cheating must also be avoided. (9) The test must be made as completely independent of schooling and educational advantages as possible. (10) The arrangement should be such as to allow a minimum of writing in recording answers. (11) The tests must consist of material which would arouse interest in the subjects. (12) The different tests used should be arranged to yield an accurate measure of intelligence in a reasonably short time (pp. 2, 3).

After much preliminary experimentation and sifting of tests, two series were chosen, named respectively *alpha* and *beta*.

The *alpha* examination was for men who could read and write English fairly well (literate), and consisted of eight tests, as follows: (1) directions or commands test, (2) arithmetical problems, (3) practical judgement, (4) synonym-antonym, (5) disarranged sentences, (6) number series completion, (7) analogies, (8) general information.

The *beta* examination was for men who were unable to read and write English well (illiterates), including foreigners, and consisted of seven tests, as follows: (1) maze test, (2) cube analysis, (3) *x* to 0 series, (4) digit-symbol, (5) number checking, (6) pictorial completion, (7) geometrical construction.

The results of these measurements were found to be reliable and constant, and were expressed in a scale of eight letter grades, viz., A (very superior), B (superior), C+ (high average), C (average), C- (low average), D (inferior), D- (very inferior), E (unfit for military service).

Besides these group tests, individual examination was carried out in many cases by the well-known Stanford-Binet tests, and also by what are termed point-scale and performance-scale examinations.



Apart from quotations of reliability coefficients, correlation coefficients, and percentage deviations, there is no discussion of the mathematical and statistical aspects of the investigation. Yet it is here that many pitfalls await the non-mathematically minded.

Nevertheless, the ultimate outcome of the investigation appears to have been eminently satisfactory, and by the time of the armistice over a million and a half of men had been given their 'intellectual rating' in this way, and the verdict of psychology had been confirmed in the very great majority of the cases by the test of experience.

Apart from the Stanford-Binet tests, which are not described, full instructions are given on the nature and mode of application of the tests, and numerous tables summarize the results in many groups tested.

The book is a compilation, and is too condensed to make easy reading, but all who are interested in this most important branch of applied psychology, the measuring of the mind, will find it most helpful and instructive.

WILLIAM BROWN.

**Psychology and Psychotherapy.** By WILLIAM BROWN, M.A., M.D. Oxon., D.Sc. Lond. Pp. 196. 1921. London: Edward Arnold. 8s. 6d.

THIS book is divided into five parts. The first deals with the concept of dissociation which is the underlying factor in the production of psychoneuroses. The author traces the developments of Janet's work through the theories of Freud and Jung, laying special stress on abreaction, or the freeing of 'pent-up' emotion. The varieties of dissociation and the related symptom-complexes are enumerated.

In the second part he criticizes Freud's theories, finding much to commend, but, like most English observers, parting from him on the universality of sex. The theories of emotion are clearly enunciated, and McDougall's treatment finds most favour.

In the third part he describes the various methods of psychotherapy, including his own methods of combining hypnosis and analysis for the purpose of autognosis or teaching the patient to know the workings of his mind.

The fourth part is devoted to a consideration of the psychoneuroses of war, of which the author had a large experience both in France and at home. He describes his methods of treatment by persuasion in the most recent cases, and by restoring forgotten memories with hallucinatory vividness under light hypnosis in the more chronic forms. Several cases are quoted which illustrate the various forms of the neuroses met with, and show how the author applies his therapy.

In the fifth part he discusses the vexed question of relationship of body and mind. As is the case in most discussions on this subject, the author proves to his own satisfaction the futility of all theories except the one to which he gives allegiance, in this case Bergson's theory of interaction.

A short bibliography is given at the end of the book.

Dr. Brown has undoubtedly written a clear and attractive volume which compares favourably with many that have appeared lately on the same subject; but the very multiplicity of these works implies how important is the personal factor of the physician in psychotherapy, for one achieves success by one method and another by another, and there is no psychological equivalent of the universal sterilizer dreamt of by the old physicians.

With regard to the scientific psychological aspect of the book, it is doubtful if the animistic attitude and dynamic theory of emotion are really as helpful as they at first appear. They certainly lead to the most wonderfully confused thinking on the part of some workers in the field of psychotherapy. As Lloyd Morgan puts it, physical science has just learnt not to mix up God with its chemical formulae, and it is time psychology learnt the same lesson. There almost certainly is an *Élan Vital*, Libido, God, call it what you will, who is the author and director of the universe; but with this psychology has nothing to do; her part is to elucidate the laws of nature in the psychic plane as physics elucidates the laws of nature in the physical plane.

R. G. GORDON.

**The Basis of Psychiatry (Psychobiological Medicine).** By ALBERT C. BUCKLEY, M.D., Associate Professor of Psychiatry, Graduate School of Medicine, University of Pennsylvania. Pp. xii+447. With 79 illustrations. 1920. Philadelphia and London: J. B. Lippincott & Co. 30s. net.

THE emphasis given to biological conceptions in this volume differentiates it from the ordinary text-book of insanity. Dr. Buckley indicates his psychiatric outlook in the preface, where he writes: "We have come to consider the group of mental disorders which belong to the class of recoverable psychoses not primarily as mental diseases, but as reflections of some bodily disorder, which, through its effect upon the organ of adjustment—the nervous mechanism and its lower and higher (psychic) reflexes—prevents the patient from making appropriate adaptations to environmental conditions, and therefore constitutes a thoroughly biological problem."

In Part I, which is devoted to general considerations, the author discusses the fundamental vital characteristics included under the term 'reaction': the development of the nervous system; heredity; cerebral development and receptive apparatus; mental development; psychological processes; etiologic factors in mental disorder; classification; symptomatology; and methods of examination.

Part II is concerned with the descriptions of the various forms of mental disorder. A good account is given of the psychoses, though the absence of clinical descriptions of actual cases makes it somewhat difficult reading for the student.

For such a large text-book it is to be regretted that the author has

designedly omitted any reference to the congenital group of cases and the tests which are now employed to estimate the degrees of mental defect. Such omissions would seem to be scarcely justified in a book which might be expected to give a thoroughly comprehensive account of mental disorder.

Throughout his book the author stresses the physical aspect of mental disorder, and in general he follows the teaching of Tanzi, Bianchi, Régis, Kraepelin, and Janet. He has a thorough acquaintance with the work of English psychiatrists, and makes frequent reference to the work of Bolton, Mott, and other writers in this country. He devotes but little attention to the views of the psychogenetic school, which, in general, has exercised a particularly strong influence on American psychiatry. Apart from the omissions to which reference has been made, the book may be recommended as a sound text-book of psychiatry, containing in its preliminary chapters biological details which are not usually included in works of this kind.

H. DEVINE.

**The Psychology of Phantasy.** By CONSTANCE E. LONG. Demy 8vo. Pp. xviii + 216. 1920: Baillière, Tindall & Cox 10s. 6d. net.

IN medical psychological circles the complaint is often made that the technique of Jung has not been clearly formulated. Dr. Long's description of her practical handling of the unconscious material in the numerous cases from which she quotes should go far to remove criticism on this score. Both Jung's conception of the unconscious and his technique will be found to be implicit in her examples of dream interpretation. There is no attempt at a systematic formulation of either, because the nature of the book does not allow of it. It is a collection of papers delivered from time to time to various societies.

In describing her cases Dr. Long shows a rare and keen insight into the subtleties and diversities of human conduct. In apprehending the subtleties she does not lose sight of the prime cause of psychological sickness, which she finds in undue persistence of instinctive trends of thought and conduct that prevent adaptation to the world of everyday reality. In so far as these have a concrete sexual content she realizes the value of Freud's reductive method of interpretation in bringing them to the light of consciousness. She whole-heartedly acclaims the value of his work, but experience has made her realize its limitations. She considers that the reductive method is only useful up to a certain stage in analysis, and that pushed beyond that stage its uncompromising use does violence to psychological data in the light of the researches in mythology of Jung and others, and fails as a therapeutic measure.

Following Jung, she employs, in addition to the reductive method, the constructive method of handling dreams. She shows that in addition to expressing an unfulfilled wish the dream has the function of presenting the psychological situation from the unconscious standpoint. This view is compensatory to, or corrective of, the conscious view. Therefore, when

rightly understood and appreciated in consciousness, it has value in promoting psychological harmony. A good example of the function of the unconscious which consists in presentation of the psychological situation is the dream of the neurotic lady who identified herself with her suffering mother. The free associations of the dreamer are tabulated. The piecing together of these associations is shown to give an accurate representation of the patient's psychological situation in the early stages of analysis. This is an admirable piece of technique, on which Dr. Long is to be congratulated.

The keynote of the book is to be found at the beginning in the quotation from Jung's *Psychological Types* (not yet published). An extract may be given:—

"It was, and always is, phantasy which builds the bridge between the irreconcilable claims of the object and of the subject, of extroversion and introversion."

Dr. Long shows how regressive phantasy is always the agent which prevents the patient from taking up the normal burden of life. On the other hand, she vindicates the truth of the above statement by examples of phantasy which, *constructively handled*, indicate the way out from the neurotic impasse.

Technical terms are used sparingly throughout. It is therefore a book eminently suitable for the general reader, and it is to be hoped that it may stem the present tide of misrepresentation and exploitation, a danger which is peculiarly liable to beset any new form of science.

JAMES YOUNG.

**Personal Beauty and Racial Betterment.** By KNIGHT DUNLAP, Professor of Experimental Psychology in the Johns Hopkins University. Cr. Svo. Pp. 95. 1920. London: Henry Kimpton. 6s.

IN this eugenic tract the author lays down the principles of beauty in the human person. He asserts that certain characteristics, negative and positive, must be fulfilled in order that a person may be regarded as beautiful, that is 'fitted for parenthood', and in the first part of the book these are defined.

In the second part he gives his views as to how beauty is to be conserved and propagated. He points out the harm done by prostitution in spreading venereal disease, but at the same time remarks that it does something to prevent the propagation of the feeble-minded in view of the low conception-rate amongst prostitutes and the large proportion of feeble-minded in their ranks.

He shows good sense in insisting that eugenics cannot be enforced by law, but only by education and publicity, and quotes the tabus against incest and inbreeding to show how easily the sexual impulses are controlled by convention. He considers that at present the world is over-populated, and that the only remedy is to spread the knowledge of how to prevent conception amongst the classes which are multiplying with undue rapidity. At the same time he points out how the most beautiful women are at

present lost to parenthood, either by making wealthy marriages, when the demand for luxury bars large families, or by being selected for the stage. He thinks that the war may have had some influence in reviving sexual selection amongst women: that is to say, that they were more inclined to consider the physical attractions of the man than his wealth and position.

He concludes by appealing to all concerned to see to it that laws, conventions, and economic conditions are shaped so as to conserve beauty instead of hindering its propagation.

R. G. GORDON.



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## Original Papers.

### ON FROIN'S SYNDROME, AND ITS RELATION TO ALLIED CONDITIONS IN THE CEREBROSPINAL FLUID.

By J. G. GREENFIELD, LONDON.

THE study of the cerebrospinal fluid is a field of investigation which during the present century has yielded a rich harvest to the neurologist. It has enabled him to diagnose certain progressive diseases of the nervous system at a stage when the patient is hardly aware that he suffers from any disability, and to distinguish with certainty between diseases which may present identical clinical pictures. Among the many changes which the cerebrospinal fluid may undergo, certainly the most striking to the clinical observer is a yellow coloration associated with the formation in the fluid, soon after it is received into a test-tube, of a coagulum, which may be so firm as to allow of the tube being turned upside down without a drop of fluid escaping. This combination of appearances was described first by Froin in 1903, and in French literature has since gone under the name of "syndrome de coagulation massive et de xanthochromie" or "syndrome de Froin". The rarity of appearance of this syndrome, the various nature of the cases in which it has been found, and the occurrence of all gradations of change from normal fluids to those presenting the typical syndrome, have combined to confuse our knowledge of its etiology and significance. And as far as British work is concerned, no attempt has been made to establish its pathogenesis or diagnostic value; in fact, beyond passing references in

text-books and papers on the cerebrospinal fluid, I have been unable to find any allusions to the subject in British publications. American schools have taken up the study of the cerebrospinal fluid with greater keenness than has been shown by the British schools, and several papers have recently appeared there on the syndrome of Froin which show intimacy with the continental work on the subject.

During the past ten years I have seen several spinal fluids which have presented the typical appearances of the syndrome of Froin, as well as a very considerable number in which changes of less degree, but similar character, were present. These fluids have been found in a great variety of forms of nervous disease, and in many of the cases I have been able to establish the diagnosis by following the case to operation or autopsy. This experience has been sufficient to enable me to test the value of current theories on the evolution of the syndrome, and to form some opinion as to its diagnostic value.

The present time is ripe for a critical review of the subject, in that some recent American work on the circulation of the cerebrospinal fluid has solved questions which have long been in dispute, and has thus made it more possible to understand the changes in the fluid which result from abnormalities in its circulation. At the same time it must be confessed that the causation of certain of these changes remains hidden in an obscurity which can only be cleared away by work in the more general field of chemical physiology.

### I.—HISTORY OF THE SUBJECT.

In surveying the literature dealing with the syndrome of Froin, it has been considered useless and tedious to detail every case in which the syndrome has been encountered either in a complete or a modified form. This has, in fact, recently been done by Lantuéjoul, who has brought up to date the cases in which the syndrome was typically present, and by Raven, who has collected a large series of cases of spinal compression in which the cerebrospinal fluid showed similar changes. I have therefore considered it more helpful to a proper understanding of the subject to trace the growth of knowledge and theory with regard to it, recording only the first cases of any special affection in which the syndrome was encountered.

**Early Observations.**—The presence of fibrinogen in the cerebrospinal fluid of cases of acute meningitis was observed by Fürbringer and Netter in the closing years of last century, but it was not until 1903 that it was found in more chronic affections of the nervous system. In that year Jean Lépine first drew attention to

the formation of a coagulum "involving about half the fluid" in the tube, in a case diagnosed as lumbar rheumatism.

Froin in the same year published three cases which he described as "Inflammations méningées avec réactions chromatique, fibrineuse, et cytologique du liquide céphalorachidien".

One of his first cases was that of a woman of 36 years, who had a paraplegia apparently of syphilitic origin. Four lumbar punctures were performed on her. The first gave a golden-yellow fluid coagulating solidly in the tube within a few minutes: the second, twelve days later, a slightly yellow fluid with less dense coagulum: the third, a fortnight after the second, gave a fluid which was only slightly yellow and formed a spider's-web coagulum after two hours. The fourth puncture, performed two months after this, gave a fluid with a very faint yellow tinge and only a few flakes of fibrin. The albumin and globulin contents of the fluids obtained at the first two punctures were greatly increased.

In the same year, 1903, Babinski described a case of spastic paraplegia which he diagnosed as due to "Méningite hemorrhagique fibrineuse". It was probably of syphilitic origin, and was cured by mercury. Lumbar puncture performed by him gave a greenish-yellow fluid which coagulated *en masse* soon after being withdrawn. It showed numerous lymphocytes. The fluid obtained on the following day by a second puncture was stirred with a glass rod immediately it was drawn, and did not clot. A week later a third puncture was performed, and paler fluid was obtained which did not clot. A fortnight later still the fluid obtained by a fourth puncture was clear, gave no coagulum, and contained fewer lymphocytes. Fifth and sixth lumbar punctures were also performed. He considered that the condition of the fluid was due to a special form of meningitis, which was improved by repeated punctures. He drew attention to the diminution in the quantity of fibrinogen in the fluid obtained by the second and successive punctures.

In the following year (1904) Cestan and Ravaut reported similar changes in the fluid of a case of flaccid paraplegia. At the autopsy they found a meningomyelitis affecting the sacral enlargement of the cord. The meningitis at this level had matted the membranes and nerve-roots together, producing a "véritable symphyse fibreuse des méninges et de la moelle". They considered that the changes in the fluid were due to hæmorrhage complicating meningomyelitis.

Occurrence of the Syndrome in Landry's Paralysis and Polyneuritis.—Several writers, however, found that the syndrome might occur in other conditions than meningomyelitis. Julius Donath, in 1905, reported a case diagnosed as 'Landry's paralysis'

in which these changes in the cerebrospinal fluid were found. The first lumbar puncture was performed during the height of the malady. The fluid came out at first rose-red, but later was colourless. This latter half, on standing, set solid in the tube like gelatin. "so dass die Eprouvette gänzlich umgekehrt werden konnte". The second lumbar puncture, a fortnight later, gave a clear, slightly yellow fluid which flowed down the sides of the tube like gelatin. It contained albumoses.

A similar case, in a young miller of 19, diagnosed as alcoholic polyneuritis, was described by Claude in 1909. Two lumbar punctures performed at an interval of six days gave slightly yellow clear fluids which coagulated 'massively' in the tube. They contained some red cells and a few leucocytes.

Renon and Monier-Vimard in the same year described a case of Landry's paralysis with similar changes in the cerebrospinal fluid.

These three cases of polyneuritis, or Landry's paralysis, made it recognized that the syndrome of Froin could appear in these conditions. The significance of this seems to have been missed by the later writers on the subject, notably by Mestrezat, in whose theory of the etiology of the syndrome there seems to be no place for polyneuritis.

'Cavité Close' Conception of the Etiology of the Syndrome. —Sicard and Deseamps, in 1908, described a case in which similar changes were found in the cerebrospinal fluid. They noted that a second lumbar puncture, performed within a few days of the first, gave a much less albuminous fluid which did not coagulate. A fortnight later the fluid had resumed the characters of that obtained at the first puncture. A fourth lumbar puncture, two days later, again gave a clear fluid without coagulum. At the autopsy they found a mass of fibrous and caseous tissue in the epidural space at the level of the 11th and 12th thoracic vertebrae, with thickening of the dura and of the soft membranes from the 10th thoracic to the 2nd sacral vertebrae. The dura was adherent to the arachnoid in some places, but not everywhere. The condition appeared to be tuberculous in origin, but no tubercle bacilli could be found in sections.

Reviewing the changes in the cerebrospinal fluid, in relation to the condition found at autopsy, they considered the meningeal inflammation to be a necessary but not sufficient cause for the syndrome, the other necessary factor being a process of adhesion whereby the plasma and corpuscular elements resulting from the inflammation were retained in a limited space. Vascular compression and local oedema they considered adjuvant causes of the syndrome. They explained the alterations in degree of the changes in

the cerebrospinal fluid at the several punctures by supposing that fresh cerebrospinal fluid from above filtered through the adhesions after the fluid below them had been drawn off. They laid stress on the value of the syndrome as an indication of meningitis rather than of tumour: but this was soon proved to be erroneous.

Indeed Rindfleisch, in 1904, had reported three cases of diffuse sarcomatosis of the meninges in which changes in the cerebrospinal fluid were found. In two of his cases the fluid was yellow, contained albumin in increased quantity (0·24 per cent and 0·1 per cent), and gave a deposit of tumour-cells. In the third the fluid was highly albuminous, but colourless, and showed very few cells. None of the fluids showed massive coagulation.

Blanchetière and Lejonne, in 1909, seem to have been the first to describe the full syndrome of Froin in a case of spinal tumour. Their case was one of slowly-developing paraplegia, with sensory loss below the level of the 7th thoracic segment, in a man of 66. The first lumbar puncture gave a lemon-yellow fluid coagulating *en masse*, but containing very few lymphocytes. Later punctures extending over a period of sixteen months invariably gave exactly similar fluids, with no reduction of the tendency to coagulate. At the autopsy a tumour was found lying under the dura mater and compressing the cord at the level of the 7th, 8th, and 9th thoracic segments. There seemed to be some adhesions between the dura mater and the dorsal surface of the cord, but the membranes stripped off the cord easily and there was no meningitis. The tumour, which was of the form and size of a large olive, gave the histological appearances of a very vascular round-celled sarcoma.

In the same year Derrien, Mestrezat, and Roger published a case of spastic paraplegia with anæsthesia and sphincter trouble, diagnosed as being due to subacute meningomyelitis in the lumbar region of the cord. The first lumbar puncture gave fluid which came out very slowly and stopped completely after 4 to 5 c.c. had escaped. It had a bright golden-yellow colour, and on standing set *en masse*. The serum from this gave only a slight fibrin web, until fresh guinea-pig serum was added, when it set again. On centrifugalization, the fluid gave a deposit of red blood-corpuscles and some lymphocytes. A second puncture a week later gave fluid at higher pressure, and less yellow, which did not clot until serum had been added. It contained 0·96 per cent albumin. The fluid obtained by a third puncture eight days later was only slightly yellow, and gave a thin fibrin clot. It was found to contain fibrin 0·03 per cent and albumin 0·6 per cent. A fourth puncture a week later gave almost colourless fluid containing 0·4 per cent albumin and no fibrinogen. A fifth puncture, a fortnight later, again gave



a fluid containing a trace of fibrinogen, but with no spontaneous coagulation. The fluids obtained by the sixth and seventh punctures were similar, but that from the eighth puncture—between which and the seventh an interval of a month had been allowed to elapse—was more definitely yellow and coagulated spontaneously, giving a spider's web of fibrin. It contained 1·08 per cent albumin. In these fluids the glucose content was often increased, two readings being as high as 0·08 per cent and 0·09 per cent. They considered that their case was due to a hæmorrhagic meningitis similar to that diagnosed by Froin, Babinski, and Cestan and Ravaut.

In commenting on Blanchetière and Lejonne's case, they held to the theory of 'cavité close' formulated by Sicard and Descamps, and considered the changes in the fluid in that case due to transudation of the principles of the plasma from the sarcoma. As adjuvant factors, they postulated obstruction of the perivascular sheaths, and compression of the cord by the tumour. These several factors, taken together, would transform the terminal part of the subarachnoid space into an isolated pouch, in which the transuded plasmatic elements would be retained.

This theory was insisted on by Mestrezat in his monograph on the cerebrospinal fluid published in 1912. He considered two factors necessary for the production of the syndrome: (1) That the lumbar cul-de-sac should be shut off from communication with the fluid around the upper part of the cord by meningitis, tumour, or disease of the bones of the spine; and (2) That there should be congestion of the spinal veins below the level of this block, or alteration of the vessel-walls by inflammatory processes. He did not insist on the necessity of a process whereby the perivascular channels were sealed up, but noted that substances such as iodides, nitrates, and collargol, when injected into the lumbar theca, did not escape from it. He also drew attention to the fact that in all the cases which had been followed to autopsy the level of the block was low down in the thoracic region of the cord, or at the lumbar enlargement. As has been noted above, his theory, being based only on cases where the pathological process had actually been seen at operation or autopsy, did not take any account of the cases of polyn neuritis or Landry's paralysis in which the syndrome had been found. Cases of these affections which have come to autopsy have given no evidence of any process which would divide the subarachnoid space surrounding the cord into upper and lower portions, or which would prevent free circulation of the cerebrospinal fluid to the lowest parts of the lumbar cul-de-sac. But it is conceivable that œdema of the cord or slight inflammation of the meninges might have this effect. If so, the block must be only a temporary

one, as it has been seen that the fluid in these conditions rapidly loses its pathological characters.

**Changes in the Cerebrospinal Fluid in Pott's Disease.**—In 1910 Sicard, Foix, and Salin drew attention to the characters of the cerebrospinal fluid in Pott's disease. They gave four cardinal signs in the fluid which, if present together, they considered pathognomonic of the disease. These were (1) yellow coloration, (2) excess of albumin without increase of cells ('dissociation albumino-cytologique'), (3) the presence of albumoses, (4) the presence of hemolysin to rabbit's red cells; the fluid by itself might not be hemolytic, but might require the addition of fresh guinea-pig serum. They laid chief emphasis on the presence of albumoses, which they considered to have the same significance as Bence-Jones albumose in the urine, and to indicate disease of the bones of the spine. They did not insist that this should be necessarily tuberculous, but considered that albumoses might also occur in malignant disease of the spine. On the other hand, they pointed out that albumoses were only found in the fluids which showed the greatest changes, and then only at the first puncture. Mestrezat, in his monograph, considered that they were due to autolysis of the albumin stagnating in an isolated cul-de-sac, a theory which would explain why they were found only in the fluid drawn off by the first puncture. It should be noted that Mestrezat's technique for the detection of albumoses was rather more delicate and perhaps less free from error than that adopted by Sicard and his fellow workers.

In the same year Cooper published in America the report of a case of localized segmental lesion of the cord from which he obtained clear fluid "of a yellowish-brown colour" which gave "a well-marked cobweb coagulum". An operation was performed at which an angiomasarcoma was found pressing on the cord, and he noted "a strongly marked œdema of the membrane below the site of the tumour. The transudate character of the fluid was thus explained". This appears to be the first case published in the English language in which such a condition was found, and the writer does not seem to have had any knowledge of similar cases published by French observers.

**Nonne's 'Compression Syndrome'.**—Nonne, in 1910, detailed six cases of tumour compressing the spinal cord in which his 'Phase-I-reaktion' (Nonne-Apelt reaction) was strongly positive in the cerebrospinal fluid without any lymphocyte increase. He did not give any details as to albumin percentages, or the presence or absence of fibrinogen, but considered that excess of globulin, with no excess of lymphocytes, was diagnostic of spinal compression.

The authority of his name gave this new syndrome an importance in German literature to which it was by no means entitled, and it is unfortunate that the term 'syndrome of Nonne' or 'compression syndrome' should have been applied to fluids of this character, which had previously been found to occur also in other conditions, such as polyneuritis.

In 1912 Raven, in Nonne's clinic, collected forty-seven cases in which this 'compression syndrome' had been found. He paid little attention to the presence or absence of fibrinogen, but noted that a coagulum formed in some cases. He agreed with the theory of Derrien, Mestrezat, and Roger, that the local compression of the cord isolated the fluid distal to it from that on its proximal side, and considered the increase of albumin due to transudation from the blood-vessels in the pia arachnoid, which were congested as a result of the blockage ("Stauungshyperämie"). The yellow colour was considered as probably due to multiple small hæmorrhages, but the stagnation of the fluid in the lower part of the subarachnoid space might contribute to it. He observed also that the yellow colour in the compression syndrome was often much more intense than that resulting from cerebral hæmorrhage.

#### Punctures Above and Below the Level of the Lesion.—

In two of his own cases Raven observed that he got by lumbar puncture a fluid of a deep yellow colour giving a heavy coagulum with the Nonne-Apelt reaction, whereas the fluid obtained by puncture above the site of compression of the cord showed no abnormality either in colour or in globulin content.

In 1913 Marinesco and Radovici published four cases observed in Bucharest in which Froin's syndrome was found. In the first, which was diagnosed as syphilitic meningomyelitis, three successive punctures made in the lumbar region gave yellow fluid which coagulated spontaneously. A fourth, made between the 11th and 12th thoracic spines, gave fluid of similar character; but a puncture between the 2nd and 3rd thoracic spines gave clear fluid which did not coagulate. They explained the yellow colour as due to a 'local bile-formation', from blood-corpuscles entering the subarachnoid space in minute hæmorrhages, and considered that the albumin was also derived from such hæmorrhages.

In the same year Marie, Foix, and Robert found a similar disparity in the fluids removed from above and below the lesion in two cases of tuberculous disease of the spine. In a third case, diagnosed as intramedullary tumour, no such difference was found. Marie, Foix, and Bouttier returned to the subject of 'double puncture' in the following year, and in one case found that the fluid removed from above the lesion was five times as rich in albumin as

that obtained by lumbar puncture. They considered that this result verified the theory of the 'cavité close' put forward by Sicard and Descomps, and by Derrien, Mestrezat, and Roger.

During the discussion of their case, Vincent stated that he had found yellow, highly albuminous fluids in several cases of tumour of the pontocerebellar angle. If in such a case a second puncture were performed within the next few days, the fluid obtained would be normal or almost so; but, if a third puncture was performed after an interval of some weeks, the fluid would again be found to be highly albuminous. He considered that these facts proved that the fluid altered its character after it was secreted.

It must be remembered that tumours of the pontocerebellar angle are sometimes associated with tumours of spinal nerve-roots, and it may have been to some such cases that Vincent referred. At the same time it is not impossible that these changes might be present in the fluid of cases of solitary eighth-nerve tumour, though I have not personally encountered this.

**Froin's Syndrome in Epidemic Cerebrospinal Meningitis.**—In 1915 Duncan Forbes and Adam reported an unusual type of cerebrospinal fluid in some fatal cases of epidemic cerebrospinal meningitis. They said that "sometimes in chronic cases which are evidently becoming worse . . . one finds the usual cloudy fluid replaced by a yellow, at times clear, fluid in which organisms may apparently be absent. This yellow fluid becomes like a jelly on standing even for a short time. . . . In no case, in which such fluid has been found, have we had a recovery".

Recent American literature has contained several references to the syndrome of Froin. Mix, in 1915, gave a clinical lecture on a case of spinal tumour in which the syndrome was found; in this he reviewed, fairly completely, the French work on the subject.

Hanes, in the following year, reported five cases of the syndrome. Two of these are of special interest. In the first case, which was that of a child of nine months with spastic paraplegia, the fluid obtained by lumbar puncture was the colour of picric acid and coagulated massively. It contained great protein excess, and 16 cells per c.mm. Hydrocephalus developed later, and fluid of a normal character was drawn from a ventricle. At the autopsy he found a ring of tubercular thickening of the meninges round the medulla. In the second case laminectomy disclosed a cyst of the pia arachnoid at the level of the 7th thoracic vertebra, below which the arachnoidal veins were seen to be greatly distended and tortuous. In this case a normal fluid was obtained by lumbar puncture six weeks after the operation.



**Experimental Production of the Syndrome.**—In 1913 Salin and Reilly, in the course of some experiments on the passage of antibodies from the blood into the cerebrospinal fluid, reproduced the syndrome of Froin experimentally. They injected a few drops of an emulsion of tubercle bacilli into the epidural space of dogs, and produced a tuberculous inflammation round the dura mater. At various intervals they tested the blood and cerebrospinal fluid for antibodies to the tubercle bacillus, by means of the Bordet-Gengou reaction. In the first experiment they found that the fluid drawn from the cisterna magna became albuminous without developing a corresponding increase in cells. It was found to contain antibodies. In their second experiment they obtained fluid both from the cisterna magna and by lumbar puncture, a month after the injection of tubercle bacilli. The fluid from the cisterna magna showed a slight increase in albumin, while that from the lumbar theca was very highly albuminous. A similar result was got from a third experiment.

More recently an attempt was made by Ayer experimentally to reproduce the conditions of pressure on the cord in which the syndrome of Froin may be encountered. He injected 1.5 c.c. of melted paraffin (melting point  $55^{\circ}$  C.) into the epidural space of cats, and removed fluid from the cisterna magna and lumbar region of the theca at varying intervals thereafter. Yellow fluid, coagulating spontaneously, was obtained by lumbar puncture within twenty-four hours of the operation in two of these experiments. But after the lapse of several days or weeks the cerebrospinal fluid obtained from both situations was normal. The result of his injections was to cover the outside of the theca for a considerable distance with a layer of paraffin which was never more than 3 mm. thick, and to produce a local myelitis of the cord at the site of injection. The latter effect was probably due to the high temperature of the 'injection mass', and was associated with the presence of polymorphonuclear leucocytes in the subarachnoid space.

In a recent paper (1920) Raven collected 145 cases of compression of the spinal cord by tumour or by disease of the vertebrae or meninges. From an analysis of these he came to the following conclusions: (1) The presence of increase of globulin content without any change in colour is uncommon in intramedullary tumours, and is more common in extra- than in intradural tumours. (2) Although xanthochromia is not limited to cases in which the site of the tumour is low in the spinal canal, it is more commonly found with tumours of this region than with those compressing the cervical region of the cord. Cases of increase of the globulin content without other change in the fluid decrease in frequency as the site of the



tumour is lower in the spinal canal. (3) Xanthochromia is no indication whether the tumour is intra- or extramedullary. (4) Rapidly increasing severe compression is more likely to cause xanthochromia than more slowly progressive forms of compression. In this connection he quotes a case of dislocation of the cervical spine in which a yellow fluid, in which no red blood-corpuscles could be seen, was obtained by lumbar puncture twenty-four hours after the accident. (5) Spontaneous coagulation is found equally in extra- and intramedullary tumours. (6) The nature of the compression is without bearing on the intensity of the changes in the fluid. (7) The character of the tumour is without influence on the development of the 'compression syndrome'.

In 1920 Lantuéjoul and Souques described a case of syphilitic meningomyelitis presenting the typical syndrome of Froin, in which very high percentages of albumin and of fibrin were found. The albumin was estimated in two puncture fluids at 4.285 per cent and 4.205 per cent; the fibrin at 0.275 per cent and 0.155 per cent. At the same time as the second lumbar puncture, another puncture was made between the 9th and 10th thoracic spines. This gave cerebrospinal fluid under slightly increased pressure which contained only 0.045 per cent albumin, the albumin contents of the fluids from the dorsal and lumbar punctures thus being in the proportion of 1 to 93.

In this year also Lantuéjoul, in the course of a review of the syndrome of Froin, found only thirty-eight pure cases in the literature, excluding all but those in which the fluid coagulated spontaneously and massively. He noted that not only had lumbar punctures on successive days given, in certain cases, fluids of different composition, but in two cases the colour and nature of the fluid had altered considerably as it flowed out of the needle: the yellow, highly-albuminous fluid which came first being followed by paler or colourless fluid showing little departure from the normal. It appeared as if, during the puncture, the lower, abnormal fluid had been progressively diluted by normal fluid from above.

## II.—PERSONAL OBSERVATIONS.

During the past two years I have examined three cerebrospinal fluids which gave the typical appearances of Froin's syndrome, as well as numerous others which resembled these in yellow colour and notable increase of albumin, but which either did not coagulate at all or not sufficiently *en masse* to justify their presentation as true cases of the syndrome. They are recorded here in order to illustrate the type of disease in which the syndrome occurs, and to throw what light they may on the etiology of the changes found in it. For the

clinical notes of these cases I am indebted to the clinical staff of the hospitals in which they occurred.

#### 1.—TYPICAL CASES OF FROIN'S SYNDROME.

##### *Case 1.*—Paget's disease of the spine.

V. C., male, age 63, was admitted to the National Hospital under Dr. Kinnier Wilson in March, 1920, with complete spastic paraplegia, which had come on gradually during the previous two years.

On March 17 lumbar puncture was done and a very small quantity of yellow fluid was obtained. This coagulated solid in the tube, so that on inversion of the tube it did not escape. The amount of fluid was too small (less than 1 c.c.) for any examination except that for cells, of which only

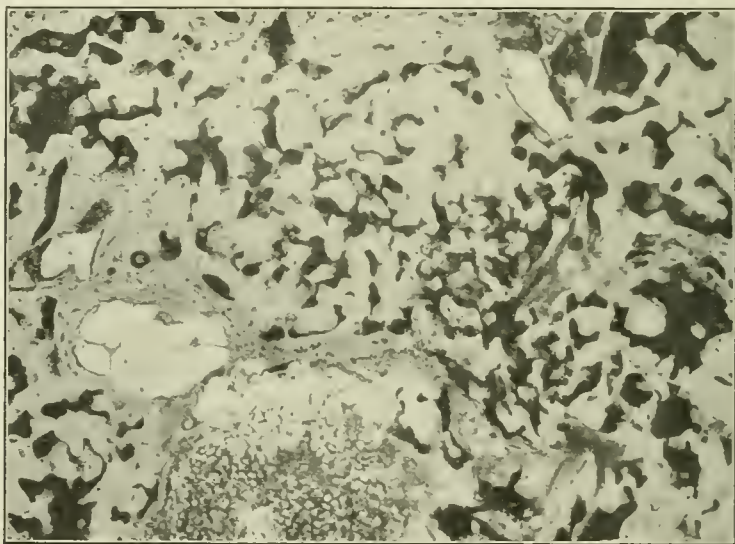


FIG. 1.—Low-power microscopic view of section of laminae from *Case 1*, showing very loose structure of the bone and, in the lower part, an area of red marrow.

red blood-corpuscles could be seen. The Wassermann reaction performed on the blood at the same time was negative.

On May 11, 1920, an operation was performed at the level of the 1st to the 4th thoracic vertebrae. No tumour was found, but there was a diffuse thickening of the laminal arches. No pulsation was visible in the dura mater covering the cord until after the laminectomy had been increased upwards.

The patient died shortly after the operation. An autopsy limited to the spine was performed about twelve hours after death. At the level of the laminectomy the vertebral laminae looked rather thicker and cut more easily than normal. Below this level the thickening and increased softness of the laminae became progressively more evident, so that in the lower dorsal and upper lumbar regions the bone could be picked away with dissecting-foreeps. The thickening of the bone caused narrowing of the

spinal canal, the dura mater being everywhere in contact with the bone, to which it was also abnormally adherent all over. The cord was removed and appeared normal. It was then seen that a small nodule projected backwards from the lower part of the body of the 8th thoracic vertebra. A smaller nodule of similar character was seen on the body of the 6th thoracic vertebra. At the lower end of the 10th thoracic vertebra the spine had a sharp concavity as though the body of the 11th thoracic vertebra had been displaced forwards. This body was shorter than those of the other vertebrae. Below this level the contour of the spine was rather irregular. No sign of thickening of the tibiae or femora could be made out, and no thickening or bossing of the skull, but a dissection of these parts was not allowed. Microscopically the laminae showed great rarefaction of the bony trabeculae, with numerous large osteoclastic cells in contact with them (*Fig. 1*). The tissue spaces were abnormally wide, and were filled with myxomatous cells with oval or elongated nuclei and long, fine, branching processes. There was also a sprinkling of small rounded lymphocyte-like cells through the interstitial tissue, and in some places collections of blood-forming marrow cells. The appearances seemed to be those of osteitis deformans.

#### Case 2.—Carcinoma of the spine.

Annie F., age 45. Admitted to the National Hospital on Sept. 6, 1919, under Dr. Holmes, complaining of loss of power in the legs of one year's duration.

On examination, she showed a nodular tumour of left breast, with a gland in the axilla. She was paraplegic in flexion, with involuntary flexor spasms, and very slight power of movement.

On Sept. 9 lumbar puncture was performed, and a yellow fluid obtained which coagulated spontaneously into a fairly dense jelly. It contained albumin, 1.2 per cent. Only a very few lymphocytes were seen in films. The Wassermann reaction was negative in blood and cerebrospinal fluid.

On Sept. 20 laminectomy was performed by Mr. Sargent, who found diffuse malignant disease of the lumbar vertebrae, which proved on histological examination to be a scirrhus carcinoma.

#### Case 3.—Intradural myxoma. Operation. Recovery.

Alfred W., age 42, admitted to the National Hospital on Oct. 22, 1920, under Dr. Hinds Howell, complaining of pain in the left side and paralysis of both legs. The pain had come on in the summer of 1918, but he had not felt his legs weak until July, 1920.

On examination, he was found to suffer from spastic paraplegia, with anaesthesia over the lower limbs.

On Oct. 26 a lumbar puncture was performed, and golden-yellow fluid escaped which coagulated solid in the tube in a few minutes. No cells were found in it. It contained 0.75 per cent albumin. No opacity was produced on 28 per cent or 33 per cent saturation with ammonium sulphate,



FIG. 2.—Macroscopic appearance of tumour removed from Case 3: 'myxo-endothelioma'.

but half saturation gave a very heavy precipitate. The Wassermann reaction was found to be negative in the blood and cerebrospinal fluid.

On Nov. 9 a laminectomy was performed by Mr. Sargent on the lower thoracic and upper lumbar regions of the spine. A large, soft, oval, gelatinous tumour, in shape and size like a pigeon's egg, was found on the left side of the cord opposite the cut arches of the 11th thoracic vertebra. It lay under the arachnoid membrane, to which, however, it was very loosely attached, and indented the cord considerably on its left posterior surface. Before the theca was opened, it was observed to pulsate normally above the tumour but not at all below it. The tumour was removed. It measured 2.5 cm. in length and 2 cm. in transverse diameter, and weighed 5 gm. On section, it was found to be composed of myxomatous tissue, with very few branching cells, the processes of which reached for long

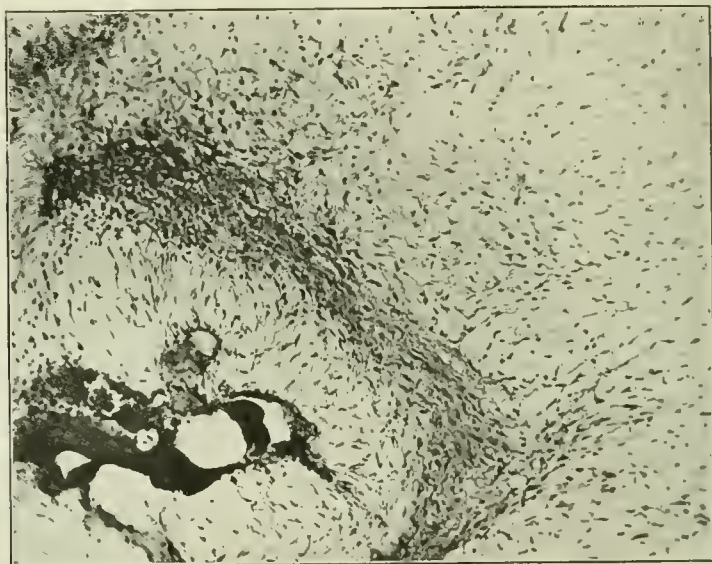


FIG. 3.—Microscopic appearance of tumour removed from Case 3.

distances and contained in their meshes clear, serous fluid: a few groups of endothelial cells were also seen in the tumour (*see Figs. 2, 3*).

The patient made a rapid recovery.

## 2.—INFLAMMATORY DISEASES OF THE MENINGES WITH HIGHLY ALBUMINOUS YELLOW FLUIDS.

### *Case 4.*—Acute myelitis of unknown origin.

Gertrude S., age 23, was admitted to the National Hospital in November, 1920, under Dr. Taylor, for paralysis of the lower limbs which had come on suddenly four months previously. The history of the onset was that on July 15, 1920, she woke with pain over the left eye, and the same evening had pain in the legs and back, with headache, and was feverish. During the night she lost the sight of her left eye, and within a few hours that of the right eye also. On the next day she could not distinguish



light from darkness, and had complete loss of power of both legs, and loss of sensation up to the face. She also had retention of urine and faeces. On July 18 she had a profuse red rash. After a fortnight of total blindness her sight improved gradually, so that on admission to hospital she could see well.

*On examination*, she was found to have a complete paraplegia of both lower limbs, which were swollen, oedematous, and quite flaccid, with incontinence of urine and faeces. All forms of sensibility were completely lost below the waist, as were also both deep and superficial reflexes.

Lumbar puncture on Nov. 29 gave a clear lemon-yellow fluid with no coagulum. It contained 0.6 per cent albumin, and with 28 per cent saturation with ammonium sulphate gave a slight opalescence indicating fibrinogen. No cells were found in it. The Wassermann reaction was negative in both blood and cerebrospinal fluid.

The diagnosis appeared to be acute meningomyelitis of the lower thoracic region, which had completely abolished conductivity in the cord.

*Case 5.*—Staphylococcal meningitis, limited by adhesions in pia arachnoid to region above 10th thoracic segment.

Pte. B. C. O., age 30. Admitted to Tooting Military Hospital on Feb. 12, 1919, with the history of four days' headache, and pains around the chest and the lower part of the back. He had vomited frequently since the onset: he was very constipated, and had at first had retention of urine.

*On examination*, he was found to have weakness of the neck muscles and head retraction. All movements of the arms were possible but weak. Only slight extension movements of the lower limbs were possible: there was no power of flexing the legs. Both plantar reflexes were in extension.

Lumbar puncture was performed on Feb. 16. Clear, dark-yellow fluid with a greenish tinge was removed. It showed 7 small lymphocytes per c.mm., and contained 3 per cent albumin, 0.65 per cent chlorides, and sugar in diminished quantity.

On Feb. 17 he had a fit at 8.0 a.m., with at first an opisthotonic position. There was tremor of both arms, with clutching movements of the right arm and hand. Shortly after the fit an attempt was made to puncture the cisterna magna by inserting a lumbar puncture needle between the atlas and the foramen magnum. When this was done, thin yellow pus came out in large quantities under increased pressure. This was full of polymorphonuclear cells, with numerous intracellular staphylococci which on culture proved to be *Staphylococcus pyogenes aureus*. After the pus settled, the fluid above it was clear and colourless. It contained 0.1 per cent albumin and 0.63 per cent chlorides. Glucose was absent.

The patient died at 3.20 p.m. on the same day, and an autopsy was performed on the following day. The brain was covered on its inferior surface with purulent exudate which filled the basal cisterns but did not run up over the outer aspect of the cerebrum. Pinetate haemorrhages were seen over the inferior surfaces of the frontal lobes. The cord, from its upper end to the 10th thoracic segment inclusive, was covered both anteriorly and posteriorly with pus. Below the 10th thoracic segment this stopped suddenly, and the surface of the cord appeared perfectly normal.

Except for chronic tuberculosis at the apices of both lungs, with a recent peribronchial spread of miliary tubercles, no disease was found in the other viscera.



*Case 6.*—Cerebrospinal syphilis.

F. G., male, age 35, was admitted to the National Hospital under Dr. Hinds Howell on May 12, 1919. In 1917, when in the army, on board a transport to India, he started putting on much weight, and arrived in India about three stone heavier than when he left England. On arrival he became unable to speak, and was sent to hospital and treated with thyroid gland extract. As he was unfit for service, he was sent back to England and discharged.

*On examination*, he was a very stout man and extremely slow in his mental processes. He presented no definite physical signs of disease of the nervous system, but the plantar reflexes gave a somewhat suspicious response.

A lumbar puncture was performed on May 19, and the fluid was examined by Dr. Nabarro, who found it to be a clear yellow fluid forming a heavy coagulum on standing. It contained 5 to 10 cells per c.mm., and 1.9 per cent albumin. The Wassermann reaction was strongly positive in the fluid, and less strongly in the blood.

A second lumbar puncture was made on June 30, when I found the fluid to be clear and yellowish without a coagulum. It contained 100 to 150 cells per c.mm., mainly of the lymphocyte type, with a few polymorphonuclear cells. The albumin totalled 0.75 per cent. The Wassermann reaction was again strongly positive in the fluid.

### 3.—PRESSURE ON SPINAL CORD DUE TO THORACIC ANEURYSM.

*Case 7.*—

H. N., male, age 53. Admitted to the National Hospital on Aug. 26, 1920, under Dr. Turner, with a history of pain in the back and hips for five months, and of loss of use of the legs for two months.

*On examination*, he was found to suffer from spastic paraplegia, with sensory loss over the thighs and loss of joint sense in the feet.

Lumbar puncture on Aug. 30 gave a yellowish clear fluid with no coagulum. It contained 15 cells per c.mm., most of them being large cells with a rounded nucleus, which were rather larger than the ordinary large mononuclear cell found in the cerebrospinal fluid. These cells were occasionally seen in groups. Albumin totalled between 0.5 per cent and 1 per cent, but owing to the small quantity of fluid obtained a more accurate reading was impossible. The Wassermann reaction was negative in blood and cerebrospinal fluid. A second lumbar puncture on Oct. 19 gave a clear colourless fluid containing no cells, with only 0.035 per cent albumin, and a weakly positive Nonne-Apelt reaction.

X-ray examination revealed a pulsating tumour on the left side of the thoracic spine, and an aneurysm of the descending thoracic aorta was diagnosed. This seemed to have eroded the vertebrae and produced pressure on the cord.

### 4.—THREE CASES OF POTT'S DISEASE AND PARAPLEGIA GIVING YELLOW HIGHLY ALBUMINOUS FLUIDS.

*Case 8.*—Pott's disease, paraplegia, and tuberculous meningitis.

Sam M., age 21, was admitted to the National Hospital under Dr. James Collier in May, 1919, with Pott's disease and paraplegia. Pain had commenced in the lower thoracic region of the spine in June, 1918,

but he was examined and passed "fit for service in France". In November, 1918, his back became curved, and in December his legs gave way under him.

*On examination*, he showed a kyphosis, almost angular in type, with the greatest prominence at the 8th dorsal spine. There was weakness of the lower part of the rectus abdominis, and complete paralysis of both lower limbs, with involuntary flexor spasms.

On July 12 an operation for the relief of pressure on the cord was performed by Mr. Sargent, who resected the laminae of the 6th to the 10th thoracic vertebrae and evacuated some cheesy pus from the body of the 9th thoracic vertebra. It was noticed that the perithecal fatty tissue was matted and infiltrated, but the dura mater looked normal.

After the operation he gradually regained slight power in his lower limbs. In October he developed a slight pleural effusion on the left side.

Towards the end of February, 1920, he showed signs suggesting meningitis, and on the 20th a lumbar puncture was performed which gave a yellow clear fluid. It did not coagulate, and showed only one cell per c.mm. It contained albumin (rather over 0.5 per cent), chlorides 0.75 per cent, and glucose about 0.04 per cent. Albumoses were also present. The Lange curve was 0.0.1.1.2.2.2.3.3.3.

The patient died on Feb. 24, 1920, and an autopsy was performed at which old-standing tuberculosis of the left lung and tuberculous pleurisy covering both lungs was found, but no evidence of recent spread in the chest. The spleen, however, showed many miliary tubercles under its capsule and elsewhere in its structure. The spine at the level of the laminectomy showed a right-angled bend over which the cord was stretched. A considerable quantity of pus escaped from the remains of the body of the 9th thoracic vertebra. The dura mater at this level was covered over and infiltrated with tuberculous granulations and pus, and was adherent to the cord. Above this level the cord and the base of the brain were covered with a thick gelatinous tuberculous exudate. Below it the surface of the cord was clearly seen, and the membranes looked perfectly healthy.

#### *Case 9.*—Pott's disease and paraplegia.

Cr., male, age 49, was admitted to the National Hospital on Feb. 10, 1920, under Dr. Risien Russell, complaining of pain in the neck and weakness of the legs. The pain in the neck had begun in May, 1919, and he noticed a lump in the back. He continued at work until Christmas, when he had to stop owing to pain spreading down from the shoulder, and to weakness of the knees. About three weeks before admission his feet felt cold, and he gradually lost power in them until he could not move them at all. About three days before admission he lost control of the bladder and rectum.

*On examination*, he showed a sharp angular curvature in the lower thoracic region, the 10th thoracic spine being the most prominent. Except for slight movement at the right hip and knee the lower limbs were completely paralyzed, and there was loss of sensibility to all forms of stimuli from the 10th thoracic segment downwards, increasing on passing towards the periphery.

On Feb. 16, lumbar puncture gave a clear yellow fluid which did not coagulate until after the addition of a drop of fresh blood. No lymphocytes were found in it, but it contained 1.5 per cent albumin. The Wassermann reaction was negative in blood and cerebrospinal fluid. On

Feb. 22 an operation for the relief of pressure on the cord was performed by Mr. Armour, who found a tuberculous cavity in the body of the 10th thoracic vertebra. The dura below the level of the curvature did not pulsate until after the removal of the laminae above, when pulsation returned.

*Case 10.—Pott's disease and paraplegia.*

Eben, H., age 17, was admitted to the National Hospital under Dr. Buzzard in April, 1920, with Pott's disease and paraplegia. He had suffered from spinal curvature since the age of 7, and from paralysis of the legs since January, 1919. This had come on gradually, and he could walk until August, 1919. The paralysis had improved slightly since November, 1919.

*On examination*, he showed a spinal curvature in the dorsal region in which scoliosis predominated over kyphosis, and the costal margins were approximated to the iliac crests. He had paraplegia in extension, with dropped feet. There was almost complete paralysis of the right leg, and considerable loss of power in the left.

Lumbar puncture performed on April 13 gave a clear lemon-yellow fluid which did not coagulate. It contained 1 lymphocyte per c.mm. and 0.8 per cent of albumin. The Wassermann reaction was negative.

These three cases are recorded as they showed very great increase of albumin in the cerebrospinal fluid. I have examined the fluids of several other cases of paraplegia due to Pott's disease, in which changes of a similar nature though of less degree were found.

5.—NINE CASES OF SPINAL TUMOUR WITH YELLOW HIGHLY ALBUMINOUS FLUIDS.

*Case 11.—Recurrence of spinal tumour (?)*

B., female, age 37, was admitted to the National Hospital under Dr. Tooth in October, 1919. She had commenced to develop paraplegia in June, 1906, and had previously been admitted to the National Hospital completely paraplegic in 1913. In January, 1914, a laminectomy had been performed, and a tumour found which completely blocked the spinal canal between the 4th and 6th thoracic vertebrae. The tumour lay in the mid-line on the posterior surface of the cord, and was removed except for its attachment to the ribbon of cord lying in front of it.

On Nov. 2, 1919, a lumbar puncture was performed and yellow cerebrospinal fluid containing some blood admixture was removed. It formed a heavy coagulum on standing, and was found to contain 2.3 per cent albumin and 0.76 per cent chlorides. No cells were found in it. On Nov. 24 a second lumbar puncture again gave a yellow fluid, which this time did not clot. It was found to contain a large number of mononuclear cells and 3.6 per cent albumin. The Wassermann reaction was negative in the blood and cerebrospinal fluid. The lymphocytes in the fluid obtained by the second puncture were explained by the hemorrhage into the subarachnoid space caused by the first puncture.

*Case 12.—Neurofibromatosis of cauda equina.*

Fred. A., age 50, was admitted to the National Hospital under Dr. Kinnier Wilson on Oct. 23, 1920, with the diagnosis of lesion of the cauda equina. The history of his disability started in 1915, when his left leg became stiff and painful, and his heel tended to rise from the ground. This

became progressively worse, and during the summer of 1920 he developed numbness and weakness, first of the left leg and then also of the right leg.

*On examination*, the spine was slightly kyphotic in the lumbar region, and there was some tenderness in the same area. Sensibility was impaired over the area of skin supplied by the 2nd to 5th lumbar segments, with partial loss in the distribution of the 1st sacral, but none in that of the lower sacral segments. There was wasting of the glutei, especially on the left side, and of all the muscles below this level, especially those of the thighs. The abdominal reflexes were diminished below the umbilicus. Neither plantar reflex nor knee-jerk could be elicited. The right ankle-jerk was brisk, but the left feeble.

On Oct. 26 lumbar puncture was performed and 5 c.c. of amber-coloured fluid escaped. The flow then ceased abruptly. This fluid was of a deep golden yellow, without a coagulum. It contained 9 lymphocytes per c.mm., and about 1.5 per cent albumin. On fractional saturation with ammonium sulphate it gave a slight opalescence with 28 per cent saturation, which increased to a fairly heavy cloud at 40 per cent saturation. The Wassermann reaction in blood and cerebrospinal fluid was negative.

I am indebted to Dr. Oxley for a report on the examination of cerebrospinal fluid obtained by him by puncturing between the 12th thoracic and 1st lumbar spines on Oct. 11. This was a bright golden-yellow fluid with a large firm clot, which contained in its meshes a few cells. The total albumin apart from the clot was 0.95 per cent. There was thus very little difference between the fluids obtained by two punctures at a fortnight's interval.

On Nov. 9 a laminectomy was performed by Mr. Sargent in the lumbar region. The membranes were found distended by growth, and formed a sausage-shaped mass twice the normal diameter of the theca. The growth was a soft, gelatinous, hæmorrhagic mass, attached all round the cord and surrounding the nerve-roots at the conus medullaris and for about 3 in. above it. This was dissected off the nerve-roots as far as possible. Unfortunately the patient developed a very severe cystitis, to which he succumbed on Nov. 20.

A post-mortem examination was made, limited to the lower part of the cord and the kidneys. The area from which the tumours had been removed was represented by a cyst formed by the membranes and containing blood. On the right side of the lumbar enlargement at a higher level there was a soft fleshy piece of tumour about 1 in. long and  $\frac{1}{4}$  in. wide lying among the nerve-roots, to which it was loosely attached. The tumours gave the typical microscopic appearances of neurofibromata.

*Case 13.*—Endothelioma pressing on the mid-thoracic region of the cord.

Dorothy F., age 19, was admitted in February, 1920, to the National Hospital under Dr. Tooth, suffering from inability to walk. Her symptoms commenced in August, 1918, when her legs became cold and numb. On examination, she showed complete paraplegia, with loss of sphincter control and of sensibility to all forms of stimuli below the 11th thoracic segment.

On Feb. 24, 1920, lumbar puncture gave a very slightly yellow fluid containing about 4 small lymphocytes to the c.mm. and 1.5 per cent albumin. It did not clot. No albumoses were found in it. The Wassermann reaction was negative in blood and cerebrospinal fluid.

A laminectomy was performed by Mr. Sargent on May 15, and



an intrathecal tumour of about the size of a walnut was found opposite the lower thoracic vertebra. It was vascular, soft, and fleshy, and had to be removed in several pieces. Histologically it gave the appearances of a fibrous endothelioma containing many round areas of fibrous tissue, in some of which calcification was commencing.

*Case 14.—Intramedullary tumour of the spinal cord.*

Mrs. S., age 48, was admitted to the National Hospital under Dr. Buzzard, complaining of paralysis of the legs of one year's duration. In February, 1919, laminectomy had been performed at the South London Hospital by Miss Davis Colley, who found thickening of the meninges in the mid-dorsal region.

On June 20, 1919, laminectomy was performed, enlarging the previous operation downwards. The cord opposite the body of the 8th thoracic vertebra was swollen and pale, and below that level the membranes were matted. No tumour was found outside the cord. A shallow incision through the postero-median fissure gave exit to a single drop of glairy fluid.

A lumbar puncture on Nov. 20 gave a yellow fluid with a heavy coagulum. Albumin was about 1 per cent, and 2 large mononuclear cells were found per c.mm.

*Case 15.—Granuloma of spine.*

A., male, age 36. Admitted May 18, 1920, to the National Hospital under Dr. Buzzard, diagnosed as spinal tumour. Since November, 1919, he had weakness in his legs, which dragged when he tried to get about, and soon after Christmas he felt as though he were walking on a cushion. Since then walking had become impossible.

On examination, he showed complete spastic paraplegia, with no voluntary power below the waist, complete loss of all forms of cutaneous sensibility below the 1st lumbar segment, and diminution between this and the 10th thoracic segment.

A lumbar puncture on May 25, 1920, gave a clear cerebrospinal fluid of a pale lemon-yellow colour which contained 4 cells per c.mm. and about 1 per cent of albumin. No coagulum formed until after a drop of blood was added, and then only a very thin web. Albumoses and peptones were absent. The Wassermann reaction was negative in cerebrospinal fluid and blood.

On June 9 laminectomy was performed by Mr. Sargent, who found an extrathecal tumour adherent to the dura and infiltrating and eroding bone in the region of the 8th and 9th thoracic vertebra. Numerous fragments of this growth were removed, weighing altogether about 8 grm. Microscopically the tumour appeared to be composed of vascular inflammatory tissue and fibrous tissue, the more cellular parts showing various forms of cells, among which small lymphocytes were most numerous; but polymorphonuclear and plasma cells were not rare, and a few larger endothelial cells were seen.

*Case 16.—Intramedullary sarcoma in upper dorsal region.*

William W., age 40, was admitted to the National Hospital under Dr. Risien Russell in October, 1920, with the diagnosis of spinal tumour. In 1917 he had had pains in the right hypochondrium which were diagnosed as due to gall-stones. In 1918 he began to have weakness and stiffness of his legs, and a tendency to retention of urine. Since August, 1920, he had become very weak on his legs.



*On examination*, he showed spasticity of both legs, with comparatively little loss of power.

Lumbar puncture on Oct. 25 gave a clear yellowish fluid without any coagulum. It contained 6 cells per c.mm. and 0.75 per cent albumin. Ammonium sulphate in 28 per cent saturation gave no opalescence; but at 33 per cent, and still more at 40 per cent saturation, there was definite opalescence. The Wassermann reaction was negative in blood and cerebrospinal fluid. On Dec. 18 a laminectomy in the upper dorsal region was performed and an intramedullary growth found, a small portion of which was removed for examination. It proved histologically to be a sarcoma of the perivascular type, being composed of a mass of small rounded cells grouped round blood-vessels, the walls of which were very thick and in places hyaline. At a certain distance from these vessels the tumour-cells tended to degenerate, so that the blood-vessels appeared to be surrounded by a collar of cells with a degenerated area outside this.

*Case 17.—Intramedullary tumour.*

Geo. B., age 28, was admitted to the National Hospital under Dr. Hinds Howell on July 11, 1919, with the diagnosis of lesion of the cauda equina. This history dated back to March, 1917, when his right leg became weak and he had pain in the lumbar region and in the right leg. In August, 1917, he had an attack of pyrexia associated with frequent involuntary jerks in the lower limbs. After this he could scarcely walk at all.

*On examination*, he was found to be almost completely paraplegic, with sensory loss to all forms of cutaneous sensibility up to the upper lumbar segments.

On July 15, 1919, lumbar puncture gave a yellowish clear fluid which did not clot even after the addition of a drop of blood. It contained 4 cells per c.mm. and 0.3 albumin. Glucose was present in about normal amount, and the chlorides were estimated at 0.71 per cent. On July 28 a laminectomy was performed by Mr. Sargent at the level of the 7th thoracic to the 1st lumbar spines. No tumour was found, but the dura mater was adherent to the pia mater, and the latter to the nerve-roots. The cord looked irregular and bulged through the dural opening. A shallow incision into the posteromedian fissure showed gliomatous matter, and a little fluid escaped.

*Case 18.—Intradural hæmangioma.*

Thos. P., age 51, was admitted to the National Hospital under Dr. Risien Russell in March, 1920, with symptoms of paralysis of the left arm and leg. The history of his affection commenced in August, 1919, with pain in the left shoulder. In November, 1919, the left arm began to lose its power, and by Christmas the left leg was awkward and stiff.

*On examination*, he presented the Brown-Séquard syndrome, having spastic weakness of the left leg, and loss of thermal and pain sensibility in the right half of the trunk and right lower limb.

A lumbar puncture on March 9 gave a very slightly yellow fluid without coagulum or cells. It contained 0.15 per cent albumin, and gave a strongly positive Nonne-Apel't reaction. The Wassermann reaction was negative in blood and cerebrospinal fluid. On April 17 a laminectomy was performed on the cervical region of the cord. On exposing the dura mater it was seen to be very tense and non-pulsatile below the 4th cervical vertebra. On opening it, an oval sessile tumour measuring 15 by 5 mm. was found lying against the left side of the cord and slightly in front of it.

It lay under the ligamentum denticulatum and the posterior nerve-roots of the 3rd and 4th cervical segments. It was removed, and the patient made a good recovery.

Microscopically the tumour was composed of papillary outgrowths and irregular strands in which numerous large vessels ran. Between these strands were clear spaces in which here and there collections of serum containing a few leucocytes and red blood-corpuscles were seen. The tumour was composed partly of fully-formed connective tissue and partly of collections of fibroblasts and endothelial cells, and in some places there were collections of brownish granules, apparently composed of hæmatoidin pigment, some of which were contained in large endothelial cells while others apparently lay free in the tissue. The tumour appeared to be a hæmangioma.

**Case 19.—Perivascular sarcoma of the conus medullaris.**

Mary E. G., age 40, was admitted to the National Hospital on Oct. 22, 1920, under the care of Dr. Farquhar Buzzard. For the previous two years she had had weakness and wasting of the right leg, pain in the right thigh, and defective sphincter control.

On examination, the right leg below the knee was found to be  $1\frac{1}{2}$  in. less in circumference than the left, and the wasted muscles had lost their faradic excitability. There was loss of sensibility to pin-prick over the area supplied by the 3rd, 4th, and 5th sacral segments on both legs, and there was diminution of the sensibility to cotton-wool over the same area, with confusion of hot and cold contacts. The knee-jerks were present, and the ankle-jerks both absent.

Lumbar puncture performed on Oct. 26 gave a clear, slightly yellow fluid which did not coagulate. It contained 3 mononuclear cells per c.mm. and 0.08 per cent albumin, and gave a trace of opalescence on 28 per cent saturation with ammonium sulphate. The Wassermann reaction in the (unheated) fluid was positive, but in the serum negative. A second lumbar puncture a fortnight later gave a clear colourless fluid with no clot. It contained no cells and only 0.04 per cent albumin. Percentage saturation with ammonium sulphate gave no opalescence below 40 per cent, but a definite haze between 40 per cent and 50 per cent saturation. The Wassermann reaction was negative in both blood and cerebrospinal fluid.

On Nov. 26 a laminectomy was performed by Mr. Sargent, and a tumour was found lying posteriorly over the lumbar enlargement. Its upper end was free, but its lower end appeared to be attached to the lower end of the conus medullaris. It was removed as completely as possible. After removal, it was found to measure  $1\frac{1}{2}$  in. in length by about  $\frac{1}{2}$  in. in transverse diameter ( $\frac{3}{4}$  in. at its widest part), and weighed 10 grm. It was pinkish-white in colour, nodular on the surface, and covered over by a smooth capsule in which veins and arteries ran. Microscopically it was



FIG. 4.—Macroscopic appearance of tumour in Case 19: 'perivascular sarcoma'.

found to be composed of small rounded or oval cells, with round nuclei, which surrounded thick-walled blood-vessels, many of which were thrombosed. A small part of the lower end of the cord had been removed along with the tumour, and this showed infiltration by tumour-cells and much glial proliferation (*see Figs. 4, 5*).

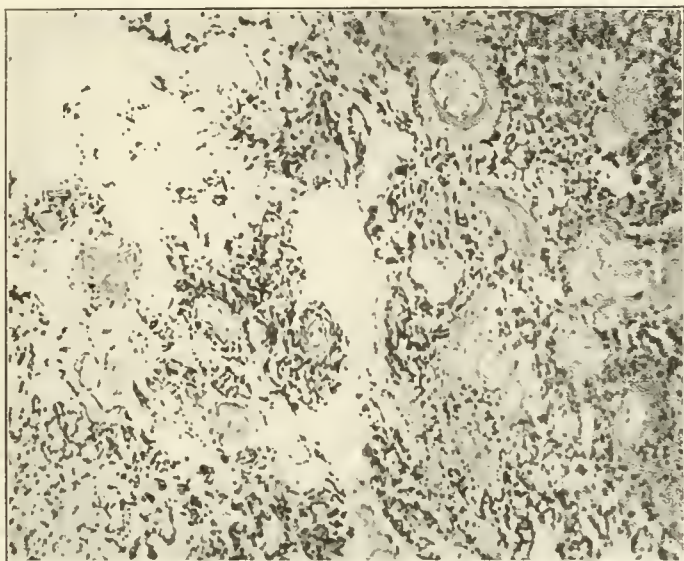


FIG. 5.—Microscopic appearance of tumour in Case 19.

#### 6.—TWO CASES OF MULTIPLE NEURITIS WITH YELLOWISH HIGHLY ALBUMINOUS FLUID.

##### *Case 20.*—

R. A., male, age 22. Admitted to the National Hospital under Dr. Collier, on Sept. 14, 1920. Paralysis of the legs, arms, and trunk commenced on Sept. 2, 1920, followed on the next day by some loss of visual accommodation. This came on a few days after a sore throat and nasal catarrh. On Sept. 5 he had some difficulty in swallowing, and two days later his voice was indistinct owing to difficulty in opening his mouth. The weakness of the legs and arms progressed, so that on Sept. 12 he was completely paralyzed in his legs except for some movement of his toes. His arms also became very weak, and he had a numb feeling over the hands.

*On examination*, he was found to be almost completely paralyzed in the limbs and trunk, and there was also some weakness of the diaphragm and of the muscles supplied by the fifth and seventh cranial nerves, especially on the left side. The pharyngeal reflex was diminished. There was some loss of sensibility to pin-prick over the arms, and some over-reaction to pin-pricks on the legs. Sense of position was defective in the legs. The co-ordination of the arms was good. All the deep reflexes were absent, and plantar stimulation gave the normal downward movement of the great toe.

Lumbar puncture performed on Sept. 17 gave a slightly yellow fluid,

which yielded on standing a fairly thick web of coagulum. Two lymphocytes per c.mm. were found in the fluid exuded from the clot. The total albumin content was found to be 0.25 per cent by the Aufrecht tube, and the Nonne-Apelt reaction was positive, but not very strongly: 0.72 per cent chlorides were found. The fluid gave a strongly positive Wassermann reaction in the unheated condition. A second lumbar puncture performed on Sept. 28 again gave a slightly yellow fluid with a thick web of coagulum. Examination showed it to contain about 1 cell per c.mm., and 0.35 per cent albumin by the Aufrecht tube. This time, after heating, the fluid and blood both gave a negative Wassermann reaction. Lumbar puncture was performed on Nov. 30 after the patient had improved considerably, and a clear colourless fluid was obtained. No cells were found in this fluid. The albumin was 0.07 per cent as measured by Mestrezat's method, and the Nonne-Apelt reaction was positive. The Wassermann reaction was again negative. The curve given by Lange's colloidal-gold reaction was 0.0.1.2.3.3.1.1.1.0.

*Case 21.—*

E. B., male, age 25, was admitted to the National Hospital under Dr. Tooth on Feb. 18, 1921. He suffered from paralysis of the arms and legs which had come on about seven months before admission. It began with twitching of the muscles at the back of the left shoulder, and pain of a dragging and shooting nature down the arm. The right arm followed soon after, and then the legs were similarly affected. Aching pains in the paralyzed limbs had been a feature of the disease.

*On examination*, he was found to present slight weakness of the right side of the face. The tongue was tremulous, and wasted at the sides. The arms were almost completely powerless, the only movements possible being slight movements of the fingers and of the arms at the shoulder girdle. In the lower limbs the only movements possible were slight movements of the toes and of the thighs at the hips. No change in cutaneous sensibility could be found. All the muscles of the body were wasted and flabby. All the deep reflexes were absent, and plantar stimulation gave a slight downward movement of the toes. The sphincters were unaffected.

Lumbar puncture performed on Feb. 21 gave a slightly yellow fluid containing 0.24 per cent albumin (Aufrecht), with a positive Nonne-Apelt reaction. No cells were found in it. Lange's reaction gave a curve as follows: 1.1.2.2.3.3.4.3.2.1. A second lumbar puncture was performed on June 7 after considerable power had returned to the limbs. A small quantity of clear slightly yellow fluid was obtained, which did not coagulate. No cells were found in it. It contained 0.16 per cent albumin by Mestrezat's method. Ammonium sulphate gave a cloudy precipitate in 50 per cent saturation, but no opalescence with 33 per cent saturation. The Lange curve was 0.0.0.1.2.2.3.3.2.1.



Table I.—ANALYSIS OF THE FOREGOING 21 CASES.

NO. OF CASE	NATURE OF CASE	CEREBROSPINAL FLUID			CELLS
		Colour	Fibrin	Albumin per cent	
1	Paget's disease of the spine	Yellow	Solid clot	?	None
2	Carcinoma of spine	Yellow	Solid clot	1.2	A few lymphocytes
3	Intradural myxoma	Yellow	Solid clot	0.75	None
4	Acute myelitis	Lemon-yellow	No coagulum, but fibrin present	0.6	None
5	Staphylococcal meningitis	Dark greenish-yellow	No clot	3	7 lymphocytes per c.mm.
6	Cerebrospinal syphilis	Yellow	Heavy coagulum	1.9	5 to 10 per c.mm.
7	Thoracic aneurysm	Yellowish	No coagulum	0.5 to 1	15 large mononuclears per c.mm.
8	Pott's disease and tubercular meningitis	Yellow	No coagulum	0.5 (Albumoses present)	1 per c.mm.
9	Pott's disease and paraplegia	Yellow	Fibrin web after addition of a drop of blood	1.5	None
10	Pott's disease and paraplegia	Lemon-yellow	No coagulum	0.8	1 per c.mm.
11	? Recurrence of spinal tumour	(1) Yellow	Heavy coagulum	2.3	None
		(2) Yellow	No coagulum	3.6	Many mononuclear cells
12	Neurofibromatosis of cauda equina	Golden-yellow	No clot. Fibrin present	1.5	9 per c.mm.
13	Endothelioma of cord	Slightly yellow	No clot	1.5	4 per c.mm.
14	Intramedullary tumour of cord	Yellow	Heavy coagulum	1	2 per c.mm.
15	? Granuloma of spine	Pale lemon-yellow	Thin web after a drop of blood	1	4 per c.mm.
16	Intramedullary sarcoma of cord	Yellow	No clot. Fibrin present	0.75	6 per c.mm.
17	Intramedullary tumour of cord	Yellow	No fibrin	0.3	4 per c.mm.
18	Intradural hæmangioma	Very slightly yellow	No coagulum	0.15	None



*Table I.—ANALYSIS OF THE FOREGOING 21 CASES—continued.*

NO. OF CASE	NATURE OF CASE	CEREBROSPINAL FLUID			CELLS
		Colour	Fibrin	Albumin per cent	
19	Perivascular sarcoma of the conus medullaris	(1) Slightly yellow	No coagulum. Fibrin present	0.08	3 per c.mm.
		(2) Colourless.	No fibrin	0.04	None
20	Peripheral neuritis	(1) Slightly yellow	Thick web of coagulum	0.25	2 per c.mm.
		(2) Slightly yellow	Thick web of coagulum	0.35	1 per c.mm.
21	Peripheral neuritis	(1) Slightly yellow	No fibrin	0.24	None
		(2) Slightly yellow	No fibrin	0.16	None

### III.—ETIOLOGY OF THE CHANGES IN THE CEREBRO-SPINAL FLUID IN THE SYNDROME OF FROIN.

A survey of these cases makes it clear that the essential feature of the syndrome of Froin is a notable increase in the percentage of albumin in the cerebrospinal fluid, and the presence of types of albumin normally absent, notably fibrinogen. Along with this there is usually some yellow coloration of the fluid of greater or less intensity; but it must be recognized that this is not a necessary concomitant of the syndrome, although fluids which coagulate sufficiently for the tube to be turned upside down without any escape of fluid constantly show some yellow colour. It is therefore necessary to consider whence this great protein increase is derived.

1. Obviously in tumours of the arachnoid and in cases of meningitis and myelitis the albumin may be transuded directly from the tumour or the focus of inflammation into the subarachnoid space. But tumours vary in vascularity, and, as Raven has shown, it is not by any means the case that vascular tumours are constantly associated with a greater protein percentage in the lumbar fluid than less vascular tumours. Again, the percentage of albumin usually found in the acutest forms of meningitis rarely rises above 0.3, and very seldom above 0.5, whereas the percentages found in the syndrome of Froin are frequently above 1 and sometimes in the region of 3 or even 4.

A survey of several cases of vascular tumour which obviously transuded serum into the cerebral ventricle or basal cisterns lends additional light to this problem (*see Table II*). In all of them the fluid was abnormally albuminous, and in one case contained fibrinogen, giving rise to fine fibrin coagulum; in most it had a yellow colour, but although a large surface of tumour growth was in relation to the cerebrospinal fluid, and seemed to be able to transude serum directly into it, the percentage of albumin was never above 0.2.

*Table II.*—FOUR CASES OF CEREBRAL TUMOUR WITH YELLOW CEREBROSPINAL FLUID.

NO. OF CASE	NATURE OF TUMOUR	COLOUR	FIBRIN	NONNE-APFELT REACTION	ALBUMIN PER CENT	CELLS
1	Gumma involving left basal ganglia and walls of ventricles	Yellowish	None	—	0.06	10 large and small mono-nuclears per c.mm.
2	Glioma of posterior half of left cerebral hemisphere extending into the lateral ventricle	Yellowish	None	Weakly positive	0.045	21 large and small mono-nuclears per c.mm.
3	Carcinoma secondary to growth in stomach growing from tentorium cerebelli and invading the cerebellum and temporal lobe	Pale yellow	Fine web	Faintly positive	0.06	No cells seen
4	Glioma involving right optic thalamus, right corpus mamillare, and anterior part of fornix	Slightly yellowish-green	None	Strongly positive	0.18	12 large and small mono-nuclears

There must therefore be some factor other than transudation concerned with the abnormal increase of albumin found in cases of tumour of the cord or its coverings, disease of the bony walls of the spinal canal, meningitis, and myelitis, which have been quoted. And it will have been seen that in almost every case there was a partial or complete closure of the subarachnoid space round the cord at some level above that at which the fluid was drawn off. In the case of staphylococcal meningitis in my series (*Case 5*) it was possible to compare the fluids drawn from above and below this level, and although the fluid from the cisterna magna was purulent and frankly inflammatory in every respect, it contained only one-thirtieth of the percentage of albumin found in the lumbar fluid. Raven, Marinesco and Radovici, Marie, Foix, Bouttier and Robert, and Lantuéjoul have quoted many cases where fluid was drawn off the subarachnoid space round the cord at various levels: the lower punctures gave fluids which showed the syndrome of Froin in a more or less typical

form, whereas the higher punctures gave fluids which differed little from the normal. There seems therefore to be no room for doubt that the syndrome depends primarily on the damming off of the fluid in the lumbar cul-de-sac from communication with the ventricular fluid. This hypothesis was advanced first by Sicard and Descamps, who considered that two factors entered into the etiology of the syndrome: first, the shutting off of the lumbar fluid from communication with the fluid derived from the ventricles; and, secondly, increased transudation from the meninges owing to congestion of the veins in the lumbar subarachnoid space. Other writers (Derrien, Mestrezat, and Roger) have suggested that a third factor is at work, namely, some process which seals up the perivascular channels and prevents the escape of subarachnoid fluid into them: for it has been noted that although in cases presenting the syndrome lumbar puncture usually gives a fluid under very low pressure, occasionally it is found that the fluid spurts out under considerably increased pressure, even when the patient is lying with his head and spine horizontal.

**Physiological Considerations.**—In order to form any estimate of the importance of these several factors, it is necessary shortly to review our knowledge of the physiology of the circulation of the cerebrospinal fluid.

There is no longer any doubt that the cerebrospinal fluid is formed entirely by the choroid plexus in the lateral, third, and fourth ventricles. But there is still some uncertainty as to the route whereby it is reabsorbed into the general circulation. Leonard Hill found that it passed out of the cranial cavity chiefly by the blood-stream, and to a less extent by the lymphatic channels of the neck. Injecting a solution of methylene blue into the cisterna magna, he found the urine coloured in less than twenty minutes, whereas the lymphatics of the neck were only seen to be coloured about one hour after the injection. The original work of Key and Retzius on the arachnoidal villi in relation to the absorption of the fluid was largely discounted by the French workers on the subject (Sicard and Cestan, Milian, Mestrezat, Cathelin), who considered that the fluid was absorbed into the blood chiefly by way of the perivascular lymphatic spaces in the cord and subarachnoid space.

The question of resorption of the fluid has recently been taken up by Cushing's school of workers, and Weed and Dandy have added considerably to our knowledge. Weed was able to show that the spinal resorption of the fluid was negligible in comparison with the intracranial resorption. He injected a readily diffusible coloured fluid into the cisterna magna, and judged the rapidity with which it returned to the blood-stream by estimating with the colorimeter the amount secreted in the urine at various periods after the injection.

He then tied the dura mater tightly in the cervical region of the cord, and, repeating the injection under otherwise similar conditions, found that the quantities of pigment recovered from the urine did not differ appreciably from those in the control experiment. Dandy formed a similar conclusion from a totally different series of experiments. Having found that the fluid did not escape through the floor of the third ventricle after blockage of the iter of Sylvius, he attempted to find out which was the chief area of resorption. He therefore surrounded the cerebral peduncles loosely with a wick of gauze dipped in iodine solution, in order that adhesions forming round the mid-brain should prevent fluid passing forwards from the posterior to the middle and anterior cranial fossæ. This he was successful in accomplishing, and as a result the animals developed hydrocephalus, although more slowly than after the iter of Sylvius had been plugged. He therefore concluded that the resorption of cerebrospinal fluid takes place chiefly from the middle and anterior cranial fossæ, and that what resorption takes place in the posterior cranial fossa and the spinal canal is insufficient to balance the amount secreted by the choroid plexuses even when the intracranial pressure is considerably raised. The work of Weed, confirming that of Key and Retzius on the arachnoidal villi, proved these structures to be the channels whereby the larger part of the fluid was returned to the circulation. He injected a solution of iron-ammonium sulphate and potassium ferrocyanide either into the subarachnoid space in the lumbar region or into the cisterna magna, and after fixation in formalin and hydrochloric acid was able to trace granules of Prussian blue into the arachnoidal villi in relation to most of the large cerebral venous sinuses.

It is true that using a similar injection fluid under higher pressure he was also able to trace the injection to the perivascular lymphatics (Virchow-Robin space) of the brain and spinal cord, and even in some cases into the nervous tissue. Both he and Mott considered that the cerebrospinal fluid passed up the perivascular channels to bathe the nerve-cells of the brain and spinal cord, but these conclusions are not universally accepted. In Weed's experiments, as above described, the injections were made under abnormally high pressures. Mott in his experiments had previously tied the carotid artery, thereby producing anæmia of the brain, and his results cannot therefore be considered as conclusive for what takes place under normal conditions.

The Virchow-Robin space normally appears completely empty in histological preparations, unless filled with cells from within the nervous tissue, as in diffuse encephalitis or poliomyelitis and in degenerative disease or destructive lesion of the brain or cord. In these diseases the cells can be traced in histological sections to the meninges in the region where the vessel enters or leaves the brain or

cord, and during life similar cells can be found in the cerebrospinal fluid. Acute syphilitic or coccal meningitis, on the other hand, does not produce infiltration of the Virchow-Robin space except in the parts nearest to the subarachnoid space. It does not therefore seem likely that there is normally a current of cerebrospinal fluid up this space from the larger to the smaller branches of the vessels. Nor can cerebrospinal fluid be absorbed by this route except by a process of diffusion in which some at least of the absorbed cerebrospinal fluid is replaced by the tissue fluid which passes into the Virchow-Robin spaces from the nervous tissue.

The other possible channel for escape of the fluid is the *perineural lymphatics*. Undoubtedly some escape of cerebrospinal fluid can take place by this route, but here again there is undoubtedly a current of lymph in the opposite direction—that is, up the nerve toward the subarachnoid space and the cord. The work of Orr and Rows, who produced toxic infection of the cord by placing celloidin capsules containing living organisms in connection with the peripheral nerves, is supported by that of Meyer and Ransome, and recently of Teale and Embleton, who have shown that tetanus toxin reaches the spinal cord along the lymphatic channels in the perineurium. Here again, therefore, any absorption of cerebrospinal fluid that occurred would merely be in exchange for the addition of a smaller or greater amount of tissue fluid to the contents of the subarachnoid space.

The spinal subarachnoid space may therefore be assumed to be a cul-de-sac from which only an extremely small bulk of fluid is drained. This does not necessarily mean that very little cerebrospinal fluid is absorbed therefrom, although on the premises even this might be granted. But it appears that what little cerebrospinal fluid is absorbed is replaced, at least in large part, by tissue fluids from the blood-stream reaching it either by way of the Virchow-Robin space or the perineural lymphatics. It must not, however, be considered that the fluid normally stagnates in the spinal cul-de-sac. Two pumping mechanisms are at work to prevent this. The cerebral arterial pulsation constantly changes the size of the brain, and as the skull and cranial dura mater form a firm, non-expansile vessel, it follows that this pulsation must be conveyed to the fluid in the more expansile spinal theca. There is also the venous pulsation due to the varying phases of respiration, which, though probably slight under normal conditions, can become very considerable when forced respiratory efforts are made. This acts both on the cerebral veins and on the large plexus of veins which lies between the spinal canal and the dura mater surrounding the cord, and it is possible that a considerable congestion of the latter plexus might almost completely empty the subarachnoid space surrounding the cord.



It is probable that in health from 400 to 800 c.c. of cerebrospinal fluid each day are secreted, circulate, and return to the general circulation. If, therefore, the communication between the various parts of the subarachnoid space is free, the normal slight addition to the cerebrospinal fluid of lymph derived from the brain, cord, and peripheral nerves is insufficient to alter greatly the chemical constitution of the whole. When, on the other hand, free communication between the ventricular and the lumbar fluids is hindered by any process which narrows the channel between the cord and dura mater, or which produces a matting of the meninges round a part of the cord, the mixing of ventricular and lumbar fluids will be reduced, or will cease completely. The fluid in the lumbar cul-de-sac will then only be able to interchange with the lymph in the Virchow-Robin space and in the perineural lymphatic channels, and it will therefore come to approximate more and more closely in composition to lymph.

On the physiological evidence just reviewed, no other factor need enter into the etiology of the syndrome than the narrowing or complete obliteration of the channel by which the cerebrospinal fluid in the cisterna magna mingles with that in the lumbar cul-de-sac. And when this factor alone is at play, the albumin content of the lumbar fluid should rise with the completeness of the block. In this connection a phenomenon described by Lantuéjoul and others is of interest. He states that in certain cases when the first puncture has given a yellow fluid coagulating spontaneously into a fairly dense jelly, a second puncture performed on the next day has given a clear colourless fluid differing little, if at all, from the normal: but after waiting for some weeks, a third puncture has given a fluid similar or approximating to the first. The explanation of this seems to be that the obstruction in the subarachnoid space, although under normal conditions complete, is of such a nature that a removal of the fluid below it will allow fresh fluid to pass it and reach the lumbar cul-de-sac. The obstruction in such cases may act as a ball-valve, allowing the passage of fluid from above downwards but not from below upwards. This would explain certain cases which present Froin's syndrome, usually in an incomplete form, and in which the fluid obtained at lumbar puncture spurts out under increased pressure. But it is clear that no valve effect is needed to produce the phenomenon described by Lantuéjoul when the obstruction in the subarachnoid space is incomplete. For the block may well be sufficient to prevent any but the slightest mixing of the fluids above and below it when the pressure on either side is approximately the same, but insufficient to prevent the passage of fluid past it when the pressure on one side is considerably reduced.

The etiology of the syndrome in cases of acute myelitis and

meningitis and of syphilitic meningomyelitis presents little difficulty. In such cases a cul-de-sac is formed by inflammatory thickening of the arachnoid, and, in most cases, by adhesions between the outer layer of arachnoid and the pia mater investing the cord. This process alone may obstruct the flow in the pial veins, and lead to capillary congestion below it: but in addition the inflammation of itself causes congestion of the vessels of the cord. Nor is the inflamed area of pia arachnoid bounded by the lower limit of the adhesions in this membrane, but extends considerably below it, and is bathed by fluid communicating with that in the lumbar cul-de-sac, which thus receives and collects the proteins coming from the inflamed vessels.

It is unfortunate that *fibrin ferment* is so often lacking in the cerebrospinal fluids which present the syndrome of Froin, and that in consequence the fluid does not clot spontaneously. It is, in fact, doubtful if fibrin ferment occurs naturally in any of the cases where the syndrome is produced by the pressure of a tumour, and this is probably the reason why the earliest cases, e.g., those described by Froin and Babinski, were of an inflammatory origin. In these fibrin ferment is constantly present, at any rate while inflammation is active. It is lucky for the history of the subject that in the operation of lumbar puncture the fluid is not always drawn off without blood contamination, for, when this occurs, fibrin ferment is provided and clotting takes place. This occurred in *Case 3*. Mestrezat has suggested that in order to demonstrate the presence of fibrinogen a drop of fresh blood or serum should be added to the fluid.

I have several times seen highly albuminous yellow fluids coagulate during the Wassermann test after the addition of complement. This completely nullifies the result of the test, and ought to be guarded against. This may be done by coagulating the fluid previously with a drop of human blood (from a non-syphilitic) or by heating the cerebrospinal fluid for half an hour to  $56^{\circ}$  C. It is stated by Starling that fibrinogen is precipitated by heating to  $56^{\circ}$  C. to  $60^{\circ}$  C., but I have never found clotting occur in the Wassermann test after the fluid had been heated at the lower temperature.

2. The earlier French writers on the subject have insisted that for the production of the syndrome, in addition to stagnation of fluid in the lumbar cul-de-sac, there should be venous congestion below the level of the block. Surgeons with great experience in the operation of laminectomy have told me that in cases of spinal compression the veins on the dorsal surface of the cord below the compression are always congested, owing to the current in these veins being chiefly upwards.

It is true that although the main effluent of the spinal veins is

into the vertebral veins at the lower border of the foramen magnum, there are also emissary veins leaving the dural sheath along with all the nerve-roots. These veins, however, especially in the lumbar region of the cord, are relatively much smaller than the accompanying arteries; and while it is possible that long-continued congestion, such as might occur below the level of a spinal tumour, might increase their lumen, the firmness of the dural sheath would form a considerable barrier to any such process. It would therefore seem to be a necessary corollary to any form of spinal compression that there should be an increase of blood-pressure in the intrathecal veins and capillaries below it.

It is probable that, apart from the effect of bacterial and other toxins on the walls of capillaries, the obstacle which these present to the escape of fibrinogen varies inversely as the pressure within them. It would follow therefore that the venous congestion resulting from the pressure of a tumour would lead to the escape of a relatively higher proportion of fibrinogen than would otherwise occur. It is stated that there are no capillary vessels in the arachnoid, and therefore the transudation of lymph into the spinal subarachnoid space must come from within the cord.

3. Froin's Syndrome in Polyneuritis and Landry's Paralysis.—While the theory of 'cavité close' is justified by the findings at autopsy or operation in a number of cases, it does not seem to explain the pathogenesis of the syndrome of Froin in the cases of polyneuritis and Landry's paralysis recorded in the literature. No such case, so far as I am aware, has come to autopsy while showing the syndrome in a typical manner, and it is therefore impossible to dogmatize on the subject. But the rapidity with which the cerebrospinal fluid regains its normal characters, as the patient is restored to health, militates against any theory which postulates inflammatory adhesions in the meninges. Nor are such adhesions found at autopsy in cases of acute polyneuritis. On the other hand, it is possible that there may be in such cases considerable swelling of the lumbar enlargement of the cord, and that this may form a slight barrier to the mixing of the fluid in the lumbar cul-de-sac with that at a higher level in the subarachnoid space.

Another factor influencing the amount of albumin in the fluid obtained at lumbar puncture in such cases is found in the inflammation of the nerves. It has been seen that there is a lymph-current up the sheaths of the nerves towards the subarachnoid space and the cord. And although the quantity of lymph which travels along this path is probably very small in conditions of health, it may be very considerable when the nerves are acutely inflamed. And when

the large size of the sciatic nerves is remembered, it is easy to understand how lymph travelling up them and reaching the subarachnoid space among the roots of the cauda equina would influence the character of the fluid drawn off from this situation.

It is, however, only a small proportion of cases of polyneuritis which shows more than a slight excess of albumin in the cerebrospinal fluid. Mestrezat considers that this increase is only shown by those cases in which the ventral horns of the cord participate in the inflammation. Eskuchen thinks that the changes in the fluid in polyneuritis are due to involvement of the meninges. But as in the cases which I have examined no definite increase in cells has accompanied the increase in albumin, I find it difficult to accept the latter hypothesis.

Landry's paralysis does not always produce changes in the cerebrospinal fluid, and Eskuchen states that the cases which he has followed to autopsy have not shown any such changes. In the present state of our knowledge, therefore, it seems impossible satisfactorily to explain why the syndrome of Froin should be present in some cases of polyneuritis and absent in others.

4. The composition of the fluids presenting the syndrome of Froin is thus accounted for in a general way by stagnation and vascular congestion. But there are some other points in connection with the syndrome into which it may be worth while briefly to inquire.

**Situation of the Block.**—It has been shown by Raven that the syndrome usually occurs with greatest intensity when the block is low down in the thoracic or lumbar region. This may be explained on several grounds. In the first place, the segmental vascular supply (i.e., excluding that derived from the vertebral artery) is much greater in the lumbar than in the thoracic region. Therefore a block which obstructed the longitudinal vascular supply in the upper thoracic region would produce more vascular congestion in the lumbar than in the thoracic regions of the cord. That is to say that, whatever the level of the block, the greatest lymph transudation would take place from the lumbar region of the cord.

Secondly, the amount of cerebrospinal fluid to which this lymph is added varies with the level of the block, being much larger when the block is high up than when it is in the lumbar region.

Thirdly, the pulsations transmitted to the fluid in the spinal theca from the vessels of the brain diminish in force from above downwards, and are probably very weak when they reach the lumbar cul-de-sac.

**Nature of the Lesion Producing the Block.**—This has been shown to influence the changes in the fluid only to a limited extent and only

in certain directions. As regards the cellular picture, while acute inflammatory processes may lead to comparatively little increase of cells in the loculated fluid, meningitis of syphilitic origin usually shows its presence by a definite lymphocytosis.

It has been seen that usually, as the albumin in the fluid rises, the glucose also rises in percentage, although to a much less degree; but when the block is caused by acute meningitis, glucose may be diminished or absent.

The proportion of the various albumin fractions is a question to which little attention has been paid, probably owing to the difficulty of the chemical analysis involved. It is not difficult to make a rough estimate of the proportions of the various globulin fractions present in a fluid by fractional salting out with ammonium sulphate after the method of Kafka. According to him, 28 per cent saturation causes precipitation of fibrinogen; 33 per cent saturation, precipitation of euglobulin; and 40 per cent saturation, of pseudoglobulin. The method is not delicate enough to show one part in 10,000 of a particular type of globulin, but will probably give a positive result with two or three parts in 10,000. I have recently applied this method to the examination of highly albuminous fluids, but it has not so far yielded any definite results in my hands.

The exact quantity of fibrin present in fluids presenting the syndrome of Froin has been estimated by several observers. Blanchetière and Lejonne found 0.17 per cent and 0.16 per cent of fibrin in their case, with 2.55 per cent and 2.75 per cent albumin. Lantuéjoul and Souques found 0.275 per cent fibrin with 4.285 per cent albumin and 0.155 fibrin with 4.2 per cent albumin. Derrien, Mestrezat, and Roger found 0.03 per cent fibrin with 0.6 per cent albumin, and no fibrinogen with 0.4 per cent albumin.

In several of my cases I have found albumin in the region of 0.2 per cent or 0.3 per cent without a trace of fibrinogen being discoverable. On the other hand, I have never examined a meningitic fluid in which the albumin had reached these levels and which did not give a copious fibrin coagulum. It would therefore appear that the proportion of fibrinogen to albumin in cerebrospinal fluids presenting the syndrome of Froin is small by comparison with that found in acute inflammatory conditions.

The proportion of globulin to albumin, on the other hand, is much higher than in meningitis. Mestrezat found in one case globulin 0.13 per cent to albumin 0.49 per cent; in another, globulin 0.22 per cent to albumin 0.65 per cent, in both cases a proportion of about 1 to 3. Blanchetière and Lejonne found globulin 0.808 per cent to albumin 1.742 per cent, a proportion nearer 1 to 2. In meningitis the proportion of globulin to albumin is much lower, 1 to 8 (Mestrezat)



or 1 to 12 (Eskuehen). In fact, the proportion of globulin to albumin found in the syndrome of Froin is only equalled by that found in progressive general paralysis, in which disease Eskuehen computes it at 3 to 7.

**Albumoses.**—Sicard drew attention to the presence of albumoses in certain spinal fluids which presented the characteristics of the syndrome of Froin, especially in cases of Pott's disease of the vertebrae. He attributed it to the disease in the spinal bones, and considered that it had the same significance as the Benec-Jones protein in the urine of cases of sarcoma of the spine. Mestrezat, on the other hand, considered that the albumoses and peptones arose from the disintegration of the stagnating albumins. It is to be noted that both writers agree that albumoses are never found except at the first puncture, and then only in exceptional cases, in which the syndrome is present in its most complete form. Only one of my own cases showed the presence of albumoses by the biuret reaction after the albumin had been removed by boiling and filtering. This was a case of tuberculous meningitis following on Pott's disease, and the albumoses may therefore have been produced either as a result of the disease in the bone, as in Sicard's hypothesis, or as a product of digestion of the pre-existing albumin in the fluid by toxins derived from the adjacent area of meningitis.

This is one of the many questions presented by the syndrome of Froin which still require elucidation, and to which a satisfactory answer can only be given after fresh work on general tissue metabolism and the interchange of tissue fluids has cleared away the haze in which these subjects are wrapped.

### SUMMARY OF CONCLUSIONS.

1. The syndrome of Froin consists essentially in the approximation of the character of the fluid obtained by lumbar puncture to that of blood-plasma. This approximation is never so complete as to render it identical.

2. This change takes place characteristically when the fluid in the lumbar cul-de-sac is completely cut off from communication with the fluid in the ventricles and cisterna magna. This may be produced by tumours or other disease in the bones of the spine, by tumours of the meninges or cord, or by inflammatory adhesions in the pia-arachnoid membranes.

3. The degree of change in the fluid depends more on the completeness of this block than on the nature of the blocking process. But certain constituents of the fluid may vary in relation to the nature of the obstruction.

4. The production of the syndrome is aided by venous congestion below the level of a compression, or by inflammation in the meninges and cord below an area of meningeal adhesion.

5. It is not necessary to postulate any obstruction of the perineural or perivascular lymphatics. The lymph which reaches the subarachnoid space along them aids in the production of the syndrome. Acute peripheral neuritis may in fact itself produce an analogous condition in the cerebrospinal fluid.

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## A CASE OF BILATERAL EIGHTH-NERVE TUMOURS ASSOCIATED WITH MULTIPLE NEUROFIBROMATA AND MULTIPLE ENDO- THELIOMATA OF THE MENINGES.

BY C. P. SYMONDS, LONDON.

THE following case is that of R. C. M., male, age 27, who was admitted to Guy's Hospital under Dr. Hurst on Oct. 23, 1920, for blindness, deafness, and inability to walk.

The History, which was obtained from the patient's wife, was that on his discharge from the Army in June, 1917, he was somewhat deaf, and complained of noises 'like a tramcar' in both ears. He also walked unsteadily, 'like a drunken man'. He suffered from severe headaches, especially in the early morning, and from dimness of vision in poor lights. The deafness progressed steadily, and by December, 1917, was absolute.

In March, 1918, he was admitted into a military hospital, where he was found to have organic nerve deafness with absent vestibular reactions, and it was also noted that he had absent ankle-jerks. The Wassermann reaction in the blood and cerebrospinal fluid was negative, but the diagnosis of tabes dorsalis was made as being the most probable explanation of this unusual combination of neurological signs. In July, 1919, his vision became much worse. In April, 1920, he began to complain of pain in the bottom of the back, and a few months later his wife noticed that in addition to the unsteadiness of his gait, long present, he showed a tendency to drag his feet when walking. The headaches became more severe, and were accompanied by vomiting. In September and October, 1920, he was a patient in an infirmary where the medical officer who looked after him noted: "His speech was, I thought, affected, being strongly suggestive of disseminated sclerosis: but his mother, with whom I have since had a talk, tells me his speech has always been slow and deliberate, and is not, in her opinion, altered". A later note adds: "His complete deafness makes investigation of his mental condition difficult: but, so far as I have been able to judge, it is little or not at all affected. In fact I have been struck with the intelligence with which he grasps a question one wishes to ask, or attempts to carry out a movement one wishes him to perform".

On admission to Guy's Hospital he complained of severe suboccipital headache, loss of sensation over the right side of the face and over the left leg, and pain in the back.

**Examination** was difficult, as the patient was almost completely blind and deaf, and greatly distressed by his headache. He could, however, be made to hear words shouted into his left ear, and by means of this and tactual sign language it was found that his mental condition was normal. He was able to give clear expression to his wishes, but his speech was halting and explosive, resembling that met with in disseminated sclerosis or cerebellar disease.\*

He could distinguish between light and darkness with the right eye, but was completely blind in the left. The optic discs showed a high degree of papilloedema with secondary atrophy.

The right pupil reacted sluggishly to light; the left was inactive. Detailed examination proved tedious owing to difficulty in getting the patient to co-operate on account of his blindness and deafness. The following additional points, however, were established in the examination of the cranial nerves: left-sided ptosis and weakness of all muscles innervated by the left third nerve; absence of both corneal reflexes; weakness of the right face, especially of the lower half; protrusion of the tongue to the right.

There appeared to be some loss of sense of position in the left hand, and general loss of cutaneous sensibility of the left leg. All tendon-jerks in upper and lower limbs were absent, nor could the epigastric or the abdominal reflexes be elicited. The plantar responses were indefinitely flexor on the right; not obtained on the left. An attempt at flexion of the neck upon the trunk revealed considerable stiffness, and gave rise to complaint of pain. Kernig's sign was also present, and its elicitation caused severe pain in the lumbosacral region radiating down the backs of the thighs.

The Wassermann reaction was negative in the blood and cerebro-spinal fluid; the latter contained 0 cells per c.mm., protein 0.04 per cent.†

A provisional diagnosis of acoustic-nerve tumour, probably bilateral, was made, and operation performed by Mr. Bromley on Oct. 30. The patient's condition at that time was extremely grave: during the five days preceding operation the temperature had been subnormal, the pulse-rate had risen from 80 to 110, and respiration was becoming steadily slower.

Suboccipital exploration revealed a tense dura, and when this

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\* I made this note before seeing those quoted above from the Infirmary records.

† Lumbar puncture was performed by the house physician before the diagnosis of a tumour in the posterior fossa had been considered.

was opened and the cerebellum exposed there occurred almost at once a gush of cerebrospinal fluid, which was followed by failure of respiration and death.

**Post-mortem Appearances.**—Apart from the changes in the skeleton and central nervous system, the only point of note was a moderate degree of mitral stenosis. (There is a doubtful history of his having had rheumatic fever when a boy.)

**The Skeleton.**—Skull: 5 cm. to the left of the lambda there is a bony mass projecting from the internal surface of the parietal bone. This is cone-shaped, with maximum height of 1 cm. and maximum diameter 2.2 cm.; 1.5 cm. above and to the right of the lambda on the internal surface of the right parietal bone there is a circular depression 1.5 cm. in diameter: this is roughly saucer-shaped, and in its centre the base is formed by a thin layer of periosteum only (*Fig. 1*). The internal auditory meatus on both sides is enlarged, especially on the right, and on this side

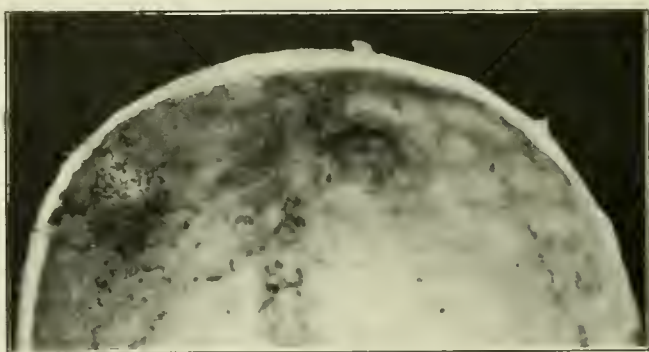


FIG. 1.—Inner surface of posterior part of calvarium, showing exostosis of left parietal bone and circular erosion of right.

a small portion of the acoustic-nerve tumour to be described broke off and remained in the meatus.

**Other bones:** No deformity of the thorax or vertebrae was noted. Both tibiae showed sabre-like bowing.

**Meninges.**—Over the left parietal lobe there is a deep depression corresponding to the bony projection in the skull, and at this point bone and dura were inseparable without the aid of a knife. Over the postero-superior surface of the right parietal lobe there is a small calcareous button growing from the outer surface of the dura, corresponding to the cavity of the skull at this point. The cerebral surface of the dura at this spot presents a punched-out hole 5 mm. in circumference, through which the tumour is adherent to brain substance; 1 cm. distant from this there is a small dome-shaped fibrous nodule in the substance of the dura. Overlying the foot of the left precentral gyrus there is another tumour growing from the internal surface of the dura. This is an irregular nodular mass, 3.5 by 2.5 cm. in its widest lateral dimensions, and 1 cm. in depth (*Fig. 2*). There are many small fibrous plaques scattered about the internal surface of the dura, which look as if they might be starting-points of other growths.



*Brain.*—Occupying the posterior part of the left parietal lobe, as shown in the photograph (*Fig. 2*), is a large solid tumour, the external surface of which is roughly circular and flush with the surface of the brain. In its centre is a depression corresponding to the bony projection of the skull referred to above, and at this point the dura is inseparable from the tumour. The diameter of the tumour is 6 cm., and it is situated in the area normally occupied by the supramarginal and angular gyri. It was readily enucleated from the brain substance, and then proved to be roughly hemispherical, as seen in the photograph (*Fig. 3*), its greatest depth being 4 cm. The contours of the neighbouring gyri are so much distorted as the result of pressure that it is not possible to determine their outlines with accuracy.



FIG. 2.—Lateral view of left hemisphere. The fissures of Sylvius and Rolando are rendered conspicuous by the insertion of strands of dark wool. In the precentral region a portion of the dura has been left intact and hinged back to show the tumour; below is the depression caused by it in the surface of the brain. The tumour of the parietal lobe has been replaced *in situ* after enucleation.

At the foot of the left precentral gyrus, and extending forward into the inferior frontal gyrus, is a depression measuring 3 by 2 cm., and 2 cm. in depth, corresponding to the tumour growing from the superjacent dura (*Fig. 2*). The anterior ascending ramus of the Sylvian fissure lies in the anterior wall of this depression, which therefore includes the intermediate and posterior parts of the inferior frontal gyrus.



FIG. 3.—Lateral view of parietal tumour shown in *Fig. 2*, after enucleation (superficial aspect to the left).

At the base of the brain the cerebellopontine angle on either side is occupied by a nodular tumour the size of a small walnut (*Fig. 4*). On the right side the fibres of the seventh nerve are visible spread out over the inferior surface of the tumour. On the left side also some fibres apparently of the seventh nerve are seen on the surface of the growth. When the tumours are lifted aside, the lateral aspect of the pons on each side is seen to be deeply indented, and the trigeminal nerves are flattened by pressure.

*Spinal Meninges and Nerve-roots.*—Growing upon the inner surface of the dura are many hard plaques of a nature similar to those seen on the cerebral dura, but of a smaller size. There are also one or two similar nodules definitely arising in the arachnoid. The largest of these latter, the size of a split pea, appears to be almost free,

being attached by very slender connections to a slip of the ligamentum denticulatum. Upon almost all the nerve-roots there are small fusiform swellings of the type usually known as neurofibromata. There is one nodular swelling much larger than the others (2 cm. in diameter) growing from one of the upper sacral roots on the right side and compressing the *conus medullaris* and the neighbouring nerve-roots (*Fig. 5*).

The outline of the left lateral surface of the cord is interrupted at the eleventh dorsal level by the projection of a round nodule which appears to lie beneath the arachnoid (*Fig. 5*).

*The Peripheral Nerves.*—During life no subcutaneous tumours were



FIG. 4.—Base of brain, showing acoustic tumour in each cerebellopontine angle.

observed of the type met with in von Recklinghausen's disease, but at the post-mortem Dr. Ryle discovered a small nodule apparently growing from one of the subcutaneous nerves of the right leg. This was taken for histological examination, but was unfortunately lost.

*Microscopic Examination.*—

Sections were cut of the tumour growing from the left eighth nerve, of a small nodule from one of the posterior nerve-roots, of the nodule described as arising from the arachnoid of the ligamentum denticulatum, and of the larger tumour situated upon the cauda equina. Sections were also cut from the inner surface of the large left-sided parietal tumour, and from the edge of the nodular growth of the dura in the left precentral area. Transverse sections were made of the cord in the mid-dorsal region, and at the point where the subarachnoid nodule referred to above lay upon its surface.

The eighth-nerve tumour shows the microscopic appearances characteristic of these growths. The area examined consisted mainly of a loose reticular formation, the cells having small round nuclei and irregular stellate cytoplasm. There are also strands of densely-packed cells with oval nuclei and slender fusiform cytoplasm which show a tendency to arrangement in whorls. These cells do not take up the fuchsin of Van Gieson's stain, but remain a brownish-yellow, in contrast with the bright pink of the blood-vessels and capsule of the tumour. Many of the vessels show great thickening and hyaline degeneration.

The sections of the tumour of the cauda equina show very much the same structure, with the addition, however, of many scattered areas in which the fusiform cells show the palisade arrangement of nuclei illustrated in Cushing's monograph.<sup>1</sup>

Longitudinal sections through the small posterior-root tumour show

this to be composed of fusiform cells of similar appearances and staining reactions to those described above.

The sections through the tumour lying upon the surface of the cord prove this to be another growth of similar type, developing apparently from posterior-root fibres, and at one point invading the substance of the cord along the line of the posterior horn of grey matter. Here the strands of advancing fusiform cells are surrounded by a marked increase in glia-cell formation. The appearances are almost identical with those figured by Bassoe and Nazum<sup>2</sup> and by Bruce and Dawson<sup>3</sup> in similar cases.

The structure of the dural tumours is that of the so-called endotheliomata. They are composed of oval or spindle-shaped cells with a definite tendency to whorl formation and calcification, and the resultant appearance of psammoma bodies. The cells lie in closely-packed masses in a framework of connective tissue and blood-vessels which takes on the characteristic pink colour with Van Gieson's stain. In the section from the edge of the smaller tumour, finger-shaped processes of these cells are clearly seen invading the under surface of the dura in a manner which reminds one of a basal-celled carcinoma.

It proved impossible to cut the arachnoid nodule without preliminary decalcification. It is almost entirely composed of psammoma bodies, in the outer walls of which occasional cells are to be seen of similar nature to those seen in the dural tumours.

A section through the cord at the mid-dorsal level stained by the Kulschitzky-Pal method shows some degeneration of the fibres of the posterior columns, presumably secondary to the posterior-root destruction at lower levels.

**Symptomatology.**—The main points in the symptomatology of eighth-nerve tumours are well known, especially since the publication of Cushing's monograph<sup>1</sup>.

In his series one case is recorded in which the presence of bilateral deafness and multiple cranial-nerve palsies led to a diagnosis of bilateral acoustic neuroma, whereas there was found after death a single large tumour on the left side, with great distortion of the pons and other structures at the base. It is of some interest to note that in this case of Cushing's there was paralysis of both third nerves, a condition for which he finds it difficult to give a satisfactory explanation. In the case recorded above, the paralysis of the left third nerve gave rise to some difficulty in making the diagnosis, but is probably to be explained as being due to the degree and duration of increased intracranial tension: in Cushing's case also the history covered more than two years, and total blindness had resulted from secondary optic atrophy. The third-nerve palsy



FIG. 5. Lower part of spinal cord with meninges and nerve-roots. For description see text.

therefore is to be regarded as one of those late 'false localizing signs' which, as Collier<sup>1</sup> has shown, often occur in the presence of greatly increased intracranial tension, adding much to the difficulties of diagnosis.

Against this, standing out in the background of the picture, is the early history of tinnitus and deafness—facts which were only elicited by close questioning of the patient's wife, but were of the highest value in arriving at the diagnosis. Cushing<sup>1</sup> has emphasized the constancy of these subjective troubles of hearing and their invariable occurrence at an *early stage* of growth in cases of eighth-nerve tumours.

It is interesting to note that in this case some degree of hearing was preserved in the left ear long after vestibular reactions had been lost. This is in accord with the view of Henschen<sup>3</sup>, that these tumours arise primarily from the vestibular rather than the cochlear root. In point of fact in this case, as in one reported by Biggs<sup>4</sup> and another by Bassoe,<sup>2</sup> the larger tumour was on the side on which hearing had been retained. It is therefore of interest to note that the right-sided tumour in this case was at its apex so firmly embedded in the internal auditory meatus that this fragment of it was broken off in removal, whereas on the left side the tumour came away from the bone quite easily. It would seem possible that the degree of deafness depends upon the tightness with which the cochlear root is wedged against the walls of the bony canal.

Passing to the symptoms of pressure upon surrounding nerves, those referable to the trigeminal are in accord with the general rule that pressure exercised upon the sensory *root* (i.e., proximal to the Gasserian ganglion) causes anæsthesia—not pain. On both sides the trigeminal root was flattened out between the tumour and the pons. The sixth nerves had, as usual in tumours of this type, escaped direct pressure. Unfortunately no note was made of the functional efficiency of this pair, but my impression is that the left eye was entirely paralyzed for outward as well as inward movement. The sixth nerve, perhaps on account of its long course, is frequently paralyzed when intracranial tension is extreme.

There is some doubt whether the facial weakness on the right side should be attributed to direct pressure upon the nerve or to the effects of the dural tumour pressing upon the left precentral cortex. Probably the latter is the correct interpretation, since the tongue also was weak on the right side without any obvious wasting. It is at any rate remarkable that such a degree of distortion of both seventh nerves should be accompanied by no more definite signs of facial palsy.

In relation to the large tumour pressing upon the cauda equina,



the most interesting point is the loss of ankle-jerks, which preceded by a long time the appearance of pain severe enough to be a prominent feature in the story. The absence of sphincter disturbances also is of interest.

On the other hand, the history was incomplete, and both root pains and loss of sphincter control may have existed at some time and have been accepted as signs of tabes.

In the later stages of the illness the absence of all tendon-jerks was presumably due to the break in the reflex arcs occasioned by the presence of the multiple tumours upon the posterior nerve-roots.

The two endotheliomata shown in *Fig. 2* are, on account of their situations, of some interest in relation to problems of the localization of speech centres in the brain. The smaller tumour had produced a considerable indentation of the cerebral surface in precisely that area in which Broca and his many followers have found that a superficial lesion will give rise to paresis of verbal utterance. The larger tumour had burrowed deeply into those parts of the parietal and temporal lobes which are considered to be of functional importance in the reception of speech and in the elaboration of intellectual processes in terms of speech.

The problems of aphasia have been recently reviewed in this country by Head<sup>7</sup> and others<sup>8</sup>; and in France Marie and Foix<sup>9</sup> have reported in detail the results of studies of aphasia following gunshot wounds of the cortex in correlation with anatomical localization of the lesions. In these papers there appears to be nothing to contradict the general statement that, in the case of a right-handed person, a lesion in either the posterior part of the inferior frontal convolution or in the supramarginal and angular gyri in the left hemisphere will give rise to disturbance in the former situation of outgoing speech and in the latter site of incoming speech.

It has been ascertained from the relatives of this patient that he was always right-handed in everything he did. On the other hand, it is to be regretted that he was not more carefully examined from the point of view of speech disturbance. He certainly had some difficulty in vocal utterance, the words being widely spaced and blurted out with undue effort. This was set down at the time of examination as being due to interference with the co-ordinating functions of the cerebellum. It may, however, have been a minimal sign of motor aphasia. In any case it was insufficient to have attracted the attention of his wife or mother.

On the receptive side one may say with certainty that there was no gross disturbance of speech recognition. Provided one shouted loud enough into his left ear, he was quick to obey any command or answer any question, however complicated. A further point of



interest is furnished by the fact that the sister in charge of his ward was an expert in tactual sign language in which the patient had been trained, and was able to ask him questions in this way. Not only was he able to appreciate the individual letters correctly, but he showed a high degree of facility in guessing the whole of a word from the first few letters, or the whole of a sentence from the first few words, according to the context. It was noticeable that he always used the left hand for the reception of these tactual messages.

Marie and Foix's<sup>9</sup> observations show that lesions of the supra-marginal and angular gyri are generally accompanied by 'global' aphasia and apraxia; and Bremer<sup>10</sup> has recently published a case in which the same clinical picture was caused by an endothelioma which in size, shape, and situation closely resembled that seen in the present instance. What, then, is the explanation of the relative absence of speech disturbance in the present case?

It may be that the extracortical tumours of slow growth, such as the endotheliomata, cause relatively little damage to the brain in spite of their great size. Evidence of this kind is furnished by the very complete recovery which patients make when these tumours are removed at operation, showing that what damage there is, is not of a permanent nature. In Bremer's case referred to above, the patient had almost completely recovered from a very severe degree of aphasia a month after his operation.

An alternative hypothesis that may be tentatively put forward in this case rests upon the theory of 'stock-brainedness'. Foster Kennedy<sup>11</sup> has collected a group of cases showing that in a right-handed person coming of left-handed stock the speech centres may be situated on the right hemisphere instead of the left. Inquiry in the present case has elicited the fact that the patient's paternal grandmother was left-handed, but that all other members of the family in the present and past generations are right-handed. It is thus barely possible that the patient, being a right-handed person, yet had his speech centres located in the right hemisphere.

**Pathology.**—The association of bilateral eighth-nerve tumours with multiple neurofibromata of the central and peripheral nervous system is well known, and, although it is a rare condition, many cases have now been recorded, of which those reported and illustrated by Bassoe and Nazum<sup>2</sup> and Hall and Beattie<sup>12</sup> are typical examples. There are, furthermore, several cases on record in which the co-existence of multiple endotheliomata of the meninges has been noted. Cushing,<sup>1</sup> in a brief review of the literature upon this point, concludes that generalized neurofibromatosis, isolated tumours of the eighth nerve, and fibro-endotheliomata of the meninges are in some fashion correlated lesions. He says "it would seem probable that some

anomaly of development of the nervous system and its envelopes must be the underlying factor". He assumes that the endotheliomata and the neurofibromata are "obviously of an utterly different pathological character".

On the other hand, Greenfield,<sup>13</sup> describing the histological appearances of a tumour of the occipital cortex in a case of this type, concludes that, although in many respects resembling an endothelioma, it is more closely allied to the other tumours (neurofibromata) of the series.

In the present case the microscopic appearances of the two sets of tumours are quite distinct, and lend support to Cushing's view. The cells of the nerve tumours are uniformly more elongated and slender than those of the dural growths. The former show no tendency to the formation of psammoma bodies, in which the latter abound. And whereas in the former there is very little connective tissue (pink staining with Van Gieson's stain) except immediately around the vessels, in the latter there is a distinct fibrous framework.

As to the nature and origin of the nerve tumours, every aspect of this problem has been most fully discussed by Durante<sup>14</sup> and in the detailed histological studies of Bruce and Dawson.<sup>3</sup>

Cushing<sup>1</sup> and Greenfield,<sup>13</sup> in recent reviews, both favour the hypothesis that these tumours arise from the cells of the neurilemma or sheath of Schwann, which originally develop from the neural crest. On this assumption, in spite of the superficial resemblance of these growths to young fibrous tissue, there is no justification for the appellation fibroma, and the term neurinoma coined by Verocay<sup>15</sup> would seem to be more suitable.

The microscopic appearances and staining reactions of the cells of this series in no respect differ from those reported by other observers, and the picture of slim fusiform cells invading the cord in the posterior-root-entry zone shows a striking similarity to that of Plate VI, Fig. 53, in Bruce and Dawson's work.<sup>3</sup> As they remark, "it seems as if the neurilemma sheath in relation to the posterior roots were continued along the fibres right into the root-entry zone".

*Bony Deformities.*—The forward bowing of the tibiae in this case was not assigned any importance in making the diagnosis, but there seems to be little doubt that it should be connected with the presence of multiple neurofibromata. Marie and Couvelaire,<sup>16</sup> in a detailed record of a case of generalized neurofibromatosis, drew special attention to the skeletal changes, which in their case were confined to the thorax. The bones were soft, flexible, and light, so soft that "on a pu modeler à sa guise ce bizarre thorax". They remark upon the likeness of the bone condition to that met with in osteomalacia, and quote other observations by Jeanselme<sup>17</sup> and Hoisnard.<sup>18</sup>

One of Jeanselme's<sup>19</sup> cases is said to have shown a *sabre-like deformity of the right tibia*. Lion and Gasne<sup>20</sup> reported a similar case in which, in addition to the thoracic deformity, there was an enlargement of one ulnar bone, in the centre of which an x-ray plate showed an area of decalcification. They also refer to a case described by Raymond in which there was similar deformity of the humerus.

Pearce Gould,<sup>21</sup> writing in 1918 upon the bony changes occurring in von Recklinghausen's disease, declares that skeletal deformities are among those constantly to be found in addition to neurofibromatosis. He further quotes a statement (without reference) to the effect that they occur in a degree noticeable during life in about 7 per cent of all cases. In one of the cases which he examined he found that all the bones were soft and cut easily with a knife, and microscopical sections showed the presence of much osteoid tissue with little calcification. He concluded that the histological picture was that of osteomalacia, rather than that of osteitis fibrosa or simple decalcification. The patient from whom the tissues were taken is said to have had an exaggerated knee-jerk and Babinski's sign on the right, but there is no post-mortem report upon the nervous system. I have not been able to find in the literature any instance in which bony changes are described in a case of central neurofibromatosis without subcutaneous tumours, but there seems to be no reason why they should not occur.

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## Short Notes and Clinical Cases.

### A CASE OF CATATONIA.

BY ROBERT CYRIL TURNBULL, COLCHESTER.

THE patient, A. P., a discharged soldier, was admitted to hospital on Feb. 11, 1918. Prior to his admission, he had been under treatment in one of the war-neuroses hospitals since the middle of March, 1917.

The information at my disposal with regard to his mental state prior to his admission is scanty. He was described as mentally enfeebled, dull, unoccupied, and taciturn, and was said to wander aimlessly about. When I examined him his condition was typical of catatonia. He was mute, negativistic, and sat always in one fixed position, with his head down between his knees, holding on firmly to the seat of his chair. His muscles were taut, his hands clenched, his toes flexed, and his insteps arched. His deep reflexes were greatly increased. The man's face was screwed up and contorted, and his eyes were firmly closed. His face and his extremities showed a tendency to cyanosis, but were rarely cold. He resisted all attempts at passive movement. He walked with a shuffling gait, and held himself in a constrained attitude. When he exercised in the gardens his heat never varied, and he would continue to walk until led to a seat. Only on one or two occasions was he heard to speak, as, for instance, when he stumbled over some other patient and gave vent to a volley of oaths. The patient would feed himself when the food was placed in front of him: his habits were never defective.

This condition was maintained until 12.45 a.m. on Jan. 11, 1921, when the patient suddenly awoke in the dormitory and asked the night attendant to be allowed to go to the lavatory. He said he felt giddy and his head was going round. He asked to see a medical officer. To the medical officer the patient gave his own account of his awakening, which is of interest. He stated:—

“ I dreamt I was in a billet at Aale in bed, in a double bed, with Sergt. A. A batman named A. C. used to sleep in the other bed on the other side of the room, and I saw in my dream that his bed was vacant. I called out “Where's A.?” This seemed to wake me. A young man in a blue suit (the night attendant) came and asked me what was the matter, and I asked him where I was.”



On examining the patient on the following day I found that his mental condition was absolutely normal, and that he showed signs of high intelligence. He had no memory of having seen me before, though I had frequently examined him previously. The only member of the staff he recognized was one official whom he remembered to have seen about the grounds when he was billeted here in 1915. The impression he produced on my mind at the time was that his mental state stood out in such glaring contrast to that of his fellow patients in the same ward that I felt he should be discharged from the hospital at the earliest possible moment. His first act on the morning of his awakening was to write a letter to a relative, a copy of which I give below :—

“ Dear G.,

“ I am writing this note after, it appears, three years’ oblivion. I can recollect things from the beginning of the war as far as March, 1917—the remainder is a blank. I awoke last night and discovered I was a patient in the above institution, where, strangely enough, we were billeted in 1915. I little thought then that I should return here to be taken care of for that long period. The attendants tell me I have not spoken a word since being here until last night, when I came to myself. I am thankful to be able to say that I am now quite *compos mentis*, and should be glad if you could arrange to take me out so that I can resume duty in the outside world. Just a rough outline of my doings since we left England on July 25, 1915 :—

“ We embarked on the transport ‘S——’ at Devonport on July 23, 1915, and sailed on the night of the 25th under sealed orders and reached Alexandria by a circuitous route (on account of submarines) fourteen days later. We sailed again the next day, and landed at Suvla Bay, Gallipoli, on Wednesday, August 11, and got under fire on Anafata Plain on the 13th, where we received a rather warm welcome. Next day we started off on a forced march to relieve some of the — Regt., who had been doing trench duty for some weeks, and rapid fire was the order of the day, during which march I was knocked over by a shell, but was fortunate enough to escape with a severe bruise only. We remained in the trenches a few days, lost our adjutant and several other officers and men, and were relieved by the — Regt., on which we proceeded up on the razor-back known as ‘Walter’s Ridge’ and reinforced the — there. Here we lost our C.O. wounded, M.O. sickness, Lieut. — killed, and about 12 N.C.O.’s and men wounded. Four days later another forced night march along the beach of Suvla Bay to W Beach, where we were for duty unloading lighters at the Engineers’ dump. While here the — Batn. moved up, and unfortunately lost 40 men by one shell, 8 killed and 32 wounded; two days there, then off to Australian Gully, where we relieved the — and — and occupied the trenches until Dec. 4, 1915, when we evacuated on the Transatlantic cattle boat ‘E——’ and proceeded to Mudros, one of the Grecian Islands. After a week there we embarked on the transport ‘M——’ and sailed for Alexandria, from which port we marched to Mex-camp, about three miles. After spending Christmas week there we were sent up on the line of communication—Alexandria to El Debbar—I myself being at No. 14 post, ‘Tkingi Mariut’; next move to Shallufa on the Suez Canal, and from thence to outlying detached posts on the desert, viz. ‘Oldham’, ‘Wigan’.

Salford', named after north-country towns by, I believe, the Manchesters. After about ten months of desert trench digging and route marching in 120° of heat, I am sorry to say I began to crack up. I hung on until I was ordered to go sick, and was then sent in to the — Ambulance with several others, from there to a convalescent dépôt at Boulae, and thence to England via H.S. 'V——' to Sicily, then by the H.S. 'A——' to Southampton. We then proceeded to Sheffield by rail, arriving at the — hospital by the end of December, 1916. I was sent on sick leave about December 29 for eight days, and then reported to the reserve battalion at Wendover. I was taken queer while there, partly, I've no doubt, due to the extreme change of climate, and was then ordered to Aylesbury for a week and to proceed home for another eight days; then I hoped to rejoin my regiment in Egypt. I entered a motor ambulance in the middle of March, 1917, and to the best of my knowledge had a smash up. From that time until January, 1921, is absolutely a blank. That is my history from July, 1915, and I hope that you will endeavour to obtain my release from this institution as soon as possible. I am addressing this to your last known place of residence, and trust it will reach you safely. Please give my best wishes to all at home.

"Hoping to hear from you shortly,

"I remain,

"Yours affectionately,

"A."

The whole of this letter is recorded because it emphasizes more than any words of mine could do the impression received of the clearness of this man's mental condition, his power of memory for detail, and his ability to express his thoughts. All I can say is that such impressions were further emphasized by personal conversation with the patient.

The following night the patient went to bed as usual, and awoke next morning still in an apparently normal condition. During the following day, however, he was noticed to become taciturn and dreamy. Unfortunately this condition grew worse, and by the evening of that day he had relapsed practically into the same state of stupor from which he had previously awakened. It was interesting to note the gradual manner in which the stupor recurred, accompanied as it was by the gradual contraction of the patient's muscles, leading to a resumption of his former constrained posture. The first physical symptom noticed by the attendants was the curling of the patient's toes towards the soles of his feet. Later, the patient relapsed into a condition of complete stupor, deeper in character than before. Mutism was complete, and the man would only feed himself when the food was placed under his nose and a spoon put into his hand. He had to be washed and dressed. When the scalp of his head was gently scratched, the patient would lift his hand to his head and start to scratch. If his ear was gently pulled, he would make a sudden movement to release it. He was on one occasion placed under an anæsthetic, and was then heard to mumble 'Form fours'. He came

round from the anæsthetic in an unaltered state of stupor. The patient still, however, continued to be scrupulously clean in his habits, and no power on earth would induce him to get into bed at night before first attending to the calls of nature.

I report this case because it appears worthy of record and discussion. That the diagnosis is one of catatonic stupor will hardly be denied by any psychiatrist, and many would include such a case in their conception of dementia præcox, a particularly all-embracing conception in these days. Be that as it may, to what disorder of the functioning of the brain are we to attribute such a startling metamorphosis as we see here displayed?

Evidently in such a case as here described we are not dealing with a typical case of dementia præcox. Power of perception, for instance, is apparently absent during the period of stupor; nor does the condition fall in line with our conception of a true neurosis, though many features of the case, especially the personal cleanliness, are suggestive of hysteria.

Clearly catatonic symptoms alone are not of necessity an expression of structural changes of the neurones due to the action of any toxin or any other cause. The brain is shown to be capable of immediate and efficient functioning, though of a temporary character, in spite of the persistence for nearly four years of catatonic symptoms.

It is also hard to believe that the functioning of the neurones has been in abeyance during these years. Such a hypothesis is untenable when the extent of their possible efficiency is revealed. Regular functioning would seem essential to the health of the living cells, and why should an exception be looked for where neurones are concerned? It would seem necessary that their functioning must somehow have been maintained and exercised, even if only in the realm of the sub-conscious. The dream mechanism of the awakening perhaps points to such a conclusion.

Does not this case suggest there is something in the hypothesis that such stupor is purely a defensive mechanism? Then the mental efficiency shown is a measure of the success of the defence put up. The symptoms of catatonia themselves irresistibly remind us of the methods adopted by many of the lower forms of life in face of outside disturbance, when they curl themselves into a ball in self-defence. Is it that in such cases there may be congenital deficiency of the neurones, more affecting their number than quality, so that when they are called upon to face stresses of special severity they are unequipped for the complexity of the adjustments required to prevent the disintegration of the psychic personality, and relief is found in the expression of catatonic symptoms which satisfy some hitherto

repressed desire and thus open up an avenue of escape for a painfully overcrowded consciousness?

The frequency with which neurotic heredity is found as an etiological factor in cases of the neuroses and in dementia præcox, also the comparative frequency of the occurrence of these disorders in subjects who obviously show some congenital mental insufficiency, is perhaps in favour of some such view, whilst the fact that no such deficiency as suggested could be demonstrated is not to be wondered at when the countless myriads of nerve elements concerned are taken into account.

It is to be regretted that no attempt at psycho-analysis of the dream could be attempted in the all too short period of mental clearness, for, whatever our views may be regarding its probable efficacy, such an attempt could scarcely have failed to be of interest.

## RECURRENT HYPERTROPHIC NEURITIS.

BY F. J. NATTRASS, NEWCASTLE-UPON-TYNE.

I HAVE recently observed, in a boy 18 years old, a clinical syndrome consisting of extensive flaccid paralysis of muscles with loss of reflexes and with electrical changes: sensory phenomena, mainly subjective; inco-ordination of movements; and hypertrophy and hardening of the nerve-trunks. Almost complete recovery has occurred, and there is evidence of two previous attacks of the same nature.

**Clinical Features.**—The patient is an apprentice joiner. He was admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne, on Nov. 5, 1920, under Dr. Beattie. He stated that a fortnight before admission he began to feel very tired and weak in the legs: the power in his legs and arms gradually diminished, and within forty-eight to seventy-two hours he had completely lost the use of his legs and could only move his arms a little. During this time he had a lot of pain in all his limbs and in his back, and after the onset of the symptoms he was unable to sit up or make any attempt to feed himself, and indeed was scarcely able to move at all. He retained complete control of the bladder and bowels, and had no difficulty in swallowing, no squint, and no other symptoms.

On admission the temperature was 98° and the pulse 80, and throughout the illness both remained normal. The patient was small for his age, and pale and of poor physique: but his sexual development was normal, and his intelligence equal to the average. His speech at first was distinctly blurred and slow, as though articulation was difficult. The tongue was furred, and the patient appeared acutely ill. The pupils were equal and reacted normally to light and accommodation, all eye movements were normal, and there was no ptosis, strabismus, nystagmus, or exophthalmos. The optic discs appeared normal. Examination of the remaining cranial nerves revealed no abnormality.

**Motor.**—Nearly all the muscles of the upper and lower limbs were wasted and showed partial or complete loss of voluntary power. In addition there was great weakness of the trunk muscles, and the patient was unable to sit up or raise the head from the pillow. In the upper limbs there was weak voluntary power in all muscles, but this diminished towards the periphery of the limbs, and the interossei, lumbricales, and the muscles of the thenar and hypothenar eminences



were much wasted and retained only very weak voluntary power. There was a coarse tremor of the upper limbs on attempting voluntary movement, and the rebound phenomenon and adiadochokinesis were marked. The tendon reflexes of the upper limbs were absent. In the upper arms all the muscles responded fairly well to faradism and quickly to galvanism: in the forearms all responded to faradism except the flexor sublimis and the flexor profundus digitorum, and the response to galvanism was fairly sharp: in the hand muscles there was no response to faradism, and the response to galvanism was slow (complete R.D.).

The abdominal reflexes were present and equal.

In the lower limbs the loss of voluntary power was complete, except for slight power of flexion of hip and knee. There was complete double foot-drop and no voluntary movement of the toes. The knee- and ankle-jerks were absent. There was a doubtful response to faradism in both quadriceps, but no response to faradism in the muscles below the knees. The anterior tibial group responded slowly to galvanism, and the peronei and calf muscles did not respond to either current. There was marked hyposensibility to the electric current, and strong currents were in all cases necessary to evoke a response.

*Sensation.*—The muscles all over the body, including those of the neck and face, were markedly tender to palpation. There was no objective sensory loss to pain, touch, heat, or cold in any part, but appreciation of the vibrations of the tuning-fork appeared to be defective. The patient complained of numbness and tingling in the periphery of all the limbs.

*Nerve-trunks.*—On palpation there was found to be very definite enlargement and apparent hardness of such nerve-trunks as could be felt, viz., the median, ulnar, and external popliteal on both sides. The enlargement was uniform and not nodular, and as far as could be detected the nerves were about one and a half times to twice their normal diameter. In addition, the trunks were distinctly tender on pressure. No enlargement of cutaneous nerves was observed, but this was not specially looked for. The Wassermann reaction of the blood was negative, blood-films showed no abnormality, and the cerebrospinal fluid obtained by lumbar puncture showed no abnormality on microscopical examination or culture.

*Previous History.*—Exactly a year previously (on Nov. 7, 1919) the patient was admitted to the Royal Victoria Infirmary with symptoms closely resembling the present attack. His history at that time was that he had been quite well till a month before admission, when he returned from work one evening complaining of 'pins and needles' in the feet. Later the same evening the pains extended

up the legs. He stayed in bed the next day, but got up on the following day: he was able to walk, but the pains recurred, and he returned to bed, and had remained there till admission. The pains spread to his back and to the upper limbs, and he gradually lost the power of all his limbs, and within a week was unable to move his legs at all. The sphincters were never affected.

The notes of his condition on admission state that the intelligence and memory were good and the speech normal: he slept well, but was not drowsy or apathetic. There was almost complete paralysis of both lower limbs, with wasting, flaccidity, and hypotonicity of the muscles. The knee-jerks, ankle-jerks, and plantar reflexes were absent. In the upper limbs there was a lesser degree of flaccid paralysis, more marked on the right side than on the left. The right supinator-jerk was absent, and the left less active than normal. The epigastric, abdominal, and cremasteric reflexes were present, and the sphincters were normal. There was no objective loss of sensibility to touch, pain, heat, or cold.

The patient remained in hospital nearly three months (until Jan. 29, 1920). He had gradually improved, and on discharge was able to walk and the paresis of the arms had disappeared. The diagnosis made was poliomyelitis. He continued to improve, and three months later resumed his ordinary work, and remained in full employment for six months, during which time he states he was in complete health, and had no pains and no weakness of any part of his limbs. At the end of this period the symptoms of the relapse appeared, leading to his re-admission.

The mother states that when the patient was 4 years of age he had a very similar illness, in which he gradually lost the power of his legs, which remained completely paralyzed for a month and then slowly recovered; the total duration of this attack before complete recovery was about six months. He had measles as a child, and an operation for removal of tonsils at the age of 5 years: otherwise he had been in good health, and the recovery from the attack of paralysis had been perfect.

**Family History.**—Father and mother healthy: three sisters, age 21, 19, and 15 years: one brother, age 13 years. All these healthy. Careful inquiry failed to elicit any history suggesting the same symptoms as those of the patient in his own or in previous generations.

**Progress.**—Evidence of gradual improvement appeared within a few days of admission, and was first noticeable in the arms. At the same time the general condition improved and the tongue became clean. Power of voluntary movement slowly appeared in the legs, and progressed steadily. The patient was kept in hospital nearly

three months (until Jan. 26, 1921), at the end of which time the upper limbs appeared normal and the lower limbs had approached complete recovery. The muscles had recovered the greater part of their normal bulk and tone, and on the left side voluntary power was present in all muscles, though it was considerably weaker than normal; on the right side there was still marked weakness of the anterior tibial muscles and peronei, but with the aid of a light toe-uplifting spring the patient could walk quite well in ordinary boots. There was no ataxia in Romberg's attitude. Since discharge the improvement has continued and the toe-uplifting spring has been abandoned. Recovery now appears to be almost perfect, and, further, the size and consistence of the nerve-trunks have become nearly normal, though in the opinion of most who have seen the case recently these trunks are still abnormally large; at any rate the greater part of the enlargement has disappeared. The knee- and ankle-jerks are still absent, and the electrical reactions are returning to the normal, the quadriceps and anterior tibial groups responding to faradism; faradic response in the calf muscles remains doubtful, as pain is produced by the current required.

The treatment adopted was the prevention of stretching of the paralyzed muscles by suitable orthopædic appliances, and gentle massage and galvanism.

**Diagnosis.**—The diagnosis of acute poliomyelitis made during the second attack was not unnatural, but in view of the subsequent course of the case must be abandoned. It is inconceivable that there could occur three attacks of acute poliomyelitis of such severity and extent as to produce almost general paralysis, in which on each occasion there was no residual paralysis.

All the appearances pointed to a multiple peripheral neuritis, but concerning the etiology of this there is no evidence. The two outstanding peculiarities of the case are: (1) The periodicity; (2) The hypertrophy of the nerve-trunks.

1. I have been unable to find any record of cases resembling the present case in the occurrence of prolonged attacks of extensive flaccid paralysis with loss of reflexes, pains, etc., followed by complete functional recovery. In family periodic paralysis the attacks are similar in many ways, but their total duration is only a few hours or days.

2. From time to time cases have been recorded of muscular paralysis associated with enlargement of peripheral nerves. In 1893 Dejerine and Sottas<sup>1</sup> described two cases under the name of 'progressive interstitial hypertrophic neuritis of infants', together with the pathological findings in one of these cases. The patients were brothers: the first symptoms were noted in infancy in one case, and

at the age of 14 years in the other, and the main features were as follows :—

*a.* Slowly progressive muscular atrophy, with fibrillary contractions, loss of deep reflexes, and partial R.D., earliest and most marked in the lower limbs, producing double talipes equinovarus, but also present in the upper limbs, giving rise to atrophy of the intrinsic muscles of the hands of the Aran-Duchenne type.

*b.* Lightning pains and marked sensory changes in the periphery of both lower and upper limbs, viz., loss of tactile sense, delay of pain sense, diminution of heat and cold senses, great alteration of muscle sense.

*c.* Inco-ordination of all limbs, with gait of tabetic type, and ataxia in Romberg's attitude.

*d.* Myosis, with Argyll Robertson pupils.

*e.* Absence of sphincter trouble.

*f.* Severe kyphoseoliosis.

*g.* Hypertrophy and hardening of all the nerves of the limbs accessible to palpation, some of the nerves appearing to be double their ordinary diameter.

*h.* Pathologically, an interstitial hypertrophic neuritis, most marked in the periphery of the nerves, but also evident in the nerve-trunks and posterior nerve-roots, the change consisting in a gradual replacement of the nerve elements by proliferating fibrous tissue, the myelin sheaths being affected early and the axis cylinders late. In addition, consecutive sclerosis of the columns of Goll and Burdach.

*i.* A very gradual onset and progressive course; the case which was examined pathologically died at the age of 45, the disease having been in existence since infancy. The cases resembled the peroneal muscular atrophy of Chareot-Marie-Tooth, but were distinguished by the marked sensory changes and the enlargement of the nerves.

Pierre Marie<sup>2</sup> in 1906 showed to the Paris Neurological Society two cases belonging to a family of seven, all afflicted with the same disease. These cases resembled in many respects those described by Dejerine and already referred to. They showed flaccid paralysis of muscles, with atrophy, loss of tendon reflexes, and partial to complete R.D.; talipes equinovarus and kyphoseoliosis; marked diminution of cutaneous sensibility; and palpable thickening of nerve-trunks and cutaneous nerves. They presented, however, certain well-marked differences. The affection was almost limited to the lower limbs, though there was definitely slight involvement of the upper as well. There were no lightning pains; no Argyll Robertson pupil, but only diminished reaction to light; and no Romberg's sign.

In place of the ataxia described by Dejerine, there was intention tremor closely resembling that of insular sclerosis; in addition there was an affection of speech recalling this latter disease; and finally there was a slight degree of exophthalmos.

In the discussion which followed, Dejerine maintained that, in spite of the differences noted, these cases belonged to his group of progressive interstitial hypertrophic neuritis.

In 1912 Schaller<sup>3</sup> described a case in a man of 20, which had begun at the age of 13 years and slowly progressed. This patient showed flaccid paralysis of muscles of the upper and lower limbs, with partial R.D. and slow response to galvanism; diminished cutaneous sensibility and considerable pallanæsthesia; inco-ordination of hands and feet, most marked with the eyes closed; some adiadochokinesis of both hands, but no asynergia or '*mouvements démesurés*'; the cranial nerves showed nothing abnormal. Associated with these signs there was hypertrophy of the nerve-trunks in the axillæ and upper arm, of the external popliteals, the superficial cervical nerves, and the cutaneous nerves of the forearms: the ulnar nerve at the elbow was about the size of a large goose-quill. A portion of a superficial cervical nerve was excised and sectioned, and the microscopical appearances were those of an interstitial hypertrophic neuritis similar to that described by Dejerine. There was no family history of the disease in this case, and considerable improvement followed the administration of arsenic by the mouth and galvanism to the muscles.

Dide and Courjon<sup>4</sup> detailed later a further case in a man commencing at the age of 40 and without family history. The wasting affected the upper limbs only, and was at first unilateral. There was no objective sensory loss, but there were shooting pains, and pressure on the enlarged nerve-trunks aroused pain. There was intention tremor, but no dysmetria or adiadochokinesis.

In a further contribution<sup>5</sup> these authors described five more adult cases of similar type.

From a study of these cases it will be seen that there are many points of close similarity between them and the case which I have described. The flaccid paralysis, with wasting, loss of reflexes, and electrical changes; some degree of sensory change; inco-ordination or intention tremor of the limbs; and the hypertrophy of the nerves, are common to all. The outstanding difference between my case and all the others is the apparently complete recovery and equally complete relapse on two occasions.

It is unnecessary to discuss the differences between this case and other conditions which are characterized by muscular paralysis with wasting. The hypertrophy of the nerves alone distinguishes it from the peroneal atrophy of Charcot-Marie-Tooth, from the muscular



dystrophies, myelitis, syringomyelia, or any of the recognized forms of peripheral neuritis. In von Recklinghausen's disease there are thickenings on the nerves, but of a nodular type quite different from an interstitial neuritis. In addition, all these conditions except peripheral neuritis are chronic and progressive.

The view of the case which I put forward is that it is a modified and recurrent type of hypertrophic interstitial neuritis as originally described by Dejerine and Sottas.

The late involvement of the axis cylinders, as described by these authors, suggests the possibility of recovery in an earlier stage by regeneration of the myelin sheaths.

The case is published in the hope of eliciting comment and further information.

I am indebted to Dr. Beattie, Senior Physician to the Royal Victoria Infirmary, Newcastle, for permission to publish the case.

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- <sup>4</sup> DIDE et COURJON, " Un cas de névrite hypertrophique de l'adulte ", *Nouv. icon. de la Salpêtrière*, 1918, 377.
- <sup>5</sup> DIDE et COURJON, *Revue neurol.*, 1919, xxvi, 825.

## Editorial.

### THE UNCONSCIOUS MOTIVE IN THE PSYCHONEUROSES OF WAR.

ALTHOUGH active interest in the psychoneuroses of the War has naturally waned with the cessation of the conditions which produced them, these disorders still provide an extremely important and fertile field for study. The editorial in the last number of the JOURNAL dealt with certain organic aspects of the subject which have been overlooked owing to the concentration of attention upon the psychological factors involved. In the present number we propose to deal with one of these psychological factors which, though by no means overlooked, has not received the attention it deserves.

The comparative simplicity of the causal factors concerned in the war psychoneuroses, the number of cases involved, and the rapidity of their development, made it possible to discern without difficulty the working of psychological mechanisms which had only been elucidated after long and patient research in the more complex and slowly developing cases met with in civil practice. Of these mechanisms, one of the most important and far-reaching was found in the action of the 'unconscious motive'.

It had long been known that in certain of the psychoneuroses phenomena were occasionally to be observed which could only be explained by the action of a factor akin to 'purpose'. The attacks of the hysterical girl only developed when her desires were thwarted or when their occurrence would obviously influence the conduct of others in consonance with the patient's wants, so that it could be said that the patient ruled the household by means of her disorder. The symptoms in cases of traumatic neurasthenia did not improve so long as litigation was pending, but rapidly cleared up when the question of compensation had been finally and satisfactorily settled. In both instances the possibility of deliberate malingering could easily be excluded by competent observers, but no satisfactory explanation of these curious phenomena was forthcoming until the advent of Freud. Freud held that the manifestations of purpose observed were only more obvious examples of a principle which held sway throughout the whole sphere of the psychoneuroses. A psychoneurosis was

the result of intrapsychic conflicts, struggles between mentally incompatible forces in the mind, each of which was striving to obtain expression; and the symptoms of the disease were to be regarded as representing a partial satisfaction of, or compromise between, the warring opponents. Hence each such symptom served a purpose in that it provided an outlet for forces in the patient's mind, and a solution of the state of conflict which would otherwise exist. Moreover, this capacity to serve a purpose or, as it might more properly be expressed, to fulfil a biological end, not only played a part in the inception of the disorder, but could attach itself to various aims in the course of subsequent development, as, for example, in the case of the hysterical girl cited above. Freud held that this 'motive', although of course the patient was not in any sense consciously aware of its existence and action, could be discerned in all the psychoneuroses and invariably played a part therein. The generalization was only reached after patient and detailed analysis of many individual cases, and naturally gave rise to considerable adverse criticisms. Investigation of the psychoneuroses of the war, however, has greatly strengthened and confirmed it.

It is generally considered that, amongst the multiplicity of factors which no doubt play a part in the production of war psychoneuroses, psychological factors hold the chief place. These consist essentially in intrapsychic conflicts in which certain of the great instinctive forces of the organism, notably the instinct of self-preservation, are involved. In ordinary civilian life the instinct of self-preservation, whenever an occasion arises in which it is stimulated to activity, is allowed comparatively free play. In warfare, however, its action is constantly inhibited by a group of opposing forces, among which may be mentioned duty, discipline, and self-respect. That is to say, the normal action of the self-preservation instinct, which would if unimpeded cause the soldier to remove himself from the place of danger, is checked by these latter forces, and a state of intrapsychic conflict is thereby produced. Under certain circumstances this conflict becomes acute, and it is then necessary that some solution should occur. The solution may come from without, by the soldier being wounded or taken prisoner. If either of these events should happen the conflict is solved, because both the opposing forces involved therein are satisfied, the self-preservation instinct by the consequent removal of the soldier from danger, while the forces of duty, discipline, and so forth are equally satisfied because this removal is necessary and inevitable. But the conflict may also be solved from within by the development of a psychoneurosis, the solution being efficient in precisely the same way as it is efficient in the wounded and the prisoner. Hence the psychoneurosis serves a biological purpose, the removal of

an intolerable conflict, and the fact that it will so serve a purpose constitutes one of the factors responsible for its appearance. In other words, an 'unconscious motive' plays a part in the production of the psychoneurosis.

Although the 'unconscious motive' is only one among the many psychological and physical factors co-operating in the causation of the war psychoneuroses, its importance can hardly be exaggerated. Its existence explains many of the curious facts observed during the War; for example, the rarity of psychoneuroses amongst the wounded and prisoners, because clearly, if a solution of the conflict has been provided from without, there is no need for a solution to develop from within. Its influence could be observed throughout the development and course of the illness, constantly retarding recovery, because recovery would mean the possibility of the resumption of the intrapsychic conflict. If the continuance of a psychoneurosis meant that the soldier would ultimately be invalided from the Army, then the unconscious motive would tend to ensure that continuance. It is clear that any efficient prophylaxis of the psychoneuroses in future wars must take these facts into consideration, and see to it that the aims to which the unconscious motive might attach itself are limited to the utmost possible extent.

Among these aims there is one which probably plays a considerable part in a medical problem still with us, the problem of the neurasthenic pensioner. It should have been apparent from our former experience of traumatic neurasthenias in civilian practice that the mechanism of the unconscious motive would easily transfer itself from its original aim to the pension itself, and that to give to psychoneurotics discharged from the Army a pension fluctuating with the severity of the symptoms, liable to reduction when improvement occurred, and to removal if recovery took place, was a course inevitably leading to unfortunate results. There can be little doubt that this method is at least in some part responsible for the intractability and difficulty of treatment experienced by all those who have to deal with neurasthenic pensioners.

## Abstracts.

### Neurology.

#### NEUROPATHOLOGY.

- [49] Experimental researches on the pathogenesis of disseminated sclerosis (Experimentelle Untersuchungen über die Pathogenese der multiplen Sklerose).—ROTHFELD, FREUND, and HORNOWSKI. *Deut. Zeits. f. Nervenhe.*, 1921, lxxvii, 257.

AN important paper, based on the investigation of some forty or more guinea-pigs and rabbits injected intravenously, intracardially, intraperitoneally, or subcutaneously, with varying amounts of cerebrospinal fluid from four typical human cases of the disease. In a number of instances the passage of the postulated virus was continued from one animal to another, in series up to as many as ten, by injection of liver, brain, and other emulsions, oxalated blood, etc. Full details are given in the protocols.

In not a single one of any of the experimental animals were spirochaetes found in central nervous system, blood, or viscera, notwithstanding repeated daily examinations by approved methods; and the authors therefore have every right to criticize adversely the conclusions of Kuhn and Steiner and other experimentalists, and to hold that in the cases of the latter there was an accidental parasitic contamination. The great majority of the animals experimented on by the authors succumbed either to coccidiosis or tuberculosis. It is admitted that the injection of blood or fluid from a case of disseminated sclerosis into a guinea-pig or rabbit has a harmful result (seven out of eleven died), but, on the other hand, from careful examination of the tissues for the cause of death, all that can be said is that either an infective agent, a micro-organism, or a toxic albumin reaction might be incriminated, and there is no pathological evidence to favour one rather than another. No specific changes of any sort whatever could be found.

Thus the experimental evidence for the spirochaetal origin of disseminated sclerosis is materially weakened, if not actually negatived.

S. A. K. W.

- [50] The pathological changes in brain and cord in pernicious anæmia and allied affections (Zum Kapitel der pathologisch-anatomischen Veränderungen des Gehirns und Rückenmarks bei perniziöser Anämie und verwandten Affektionen).—WOHLWILL. *Deut. Zeits. f. Nervenhe.*, 1921, lxxvii, 438.

THIS paper is based on the examination of some twenty cases of pernicious anæmia, of which ten had more or less widespread spinal lesions; two



were instances of 'funicular myelitis' or 'funicular spinal disease'—an expression of German origin supposedly superior to 'anæmic spinal disease'. There is no mention either in text or bibliography of the English work on subacute combined degeneration of the spinal cord.

The author shows that the local lesions of 'funicular spinal disease' consist of a special 'neurolytic' swelling of the axones, with a glial reaction both of a proliferative and a regressive nature. Increase of the cells of the vascular intima is very common, but it cannot be regarded as the cause of the parenchymatous changes. Lymphocytic infiltration is rare, and of no significance from the causative viewpoint. In the brain, lipoid degeneration of the cells is a usual feature, and diffuse progressive glial alterations, though there is little actual neuronophagia. These changes appear to be most marked in cases which have been associated during life with the development of a psychosis. The author has not found in the brain lesions strictly similar to those of the spinal cord. In pernicious anæmia, hæmorrhages and 'ring-like' lesions round vessels occur, and they are to be distinguished from the specific lesions of the spinal cord above referred to; they, too, have no etiological import.

S. A. K. W.

[51] Syphilis and degeneration.—B. P. THOM. *Jour. Nerv. and Ment. Dis.*, 1921, liii, 8.

THE author estimates that 10 per cent of the white and 30 per cent of the coloured population of the United States suffer from hereditary or acquired syphilis, and that this disease accounts for practically all the degeneracy. Hereditary syphilis may be very hard to detect in the absence of stigmata, though the cerebrospinal fluid will usually show a positive Wassermann. Syphilis in the parents will affect the offspring in three ways: (1) By direct infection of the germ-cell with the *Spirochata pallida*. He points out the occurrence of late hereditary syphilis which may show no signs till adult life is reached. (2) By chemical or molecular changes in the germ-cell produced by toxins derived from the spirochæte. These may lead to arrest of development both mental and physical, but of course the tissue fluids of the child will not give a positive Wassermann. (3) The author suggests that the abiotrophies in the second and third decades may be due to affection of the germ-cell by the spirochæte or its toxins. He would put down all severe hysterias, psychasthenias, and neurasthenias to the presence of lues in the father. Degeneracy is a misnomer, as it is often found that so-called degenerates are superior rather than inferior to their forebears, at any rate in some respects; therefore it would be better to substitute the word deviation to imply that they differ from the normal.

The author would attribute most crime, mental arrest and deterioration to the effects of syphilis; but he brings no proof of this assumption except some figures of Atwood's, which do not much favour the thesis, and which he regards as inconclusive. This speculation is probably largely true, but cannot be of real value unless supported by clinical facts.

R. G. GORDON.

- [52] A case of cerebral porosis, with a histopathologic report.—  
GEORGE B. HASSIN. *Arch. of Neurol. and Psychiat.*, 1920, iv, 645.

IN cerebral porosis the brain tissue contains a large number of cavities combined with minute holes generally described as 'état criblé'. The condition is usually regarded as an artefact, due either to cadaveric changes or to the chemical agents used in fixation and hardening. In the present report evidence is adduced to show that cerebral porosis possesses certain essential pathological features which are due to intra-vitam changes.

A woman, 24 years old, died on the fourteenth day of her illness with symptoms of hæmolytic jaundice. A necropsy was performed fifteen hours after death, the body having been kept in a refrigerating room. *Bacillus aerogenes capsulatus* was isolated in pure culture from the heart's blood, and practically all the organs of the body showed a gas-bacillus infection. The brain contained an enormous number of cavities, most numerous in the basal ganglia, cerebral white matter, cerebellum, and brain-stem; the cerebral cortex, although macroscopically normal, also showed much smaller cavities, causing a sieve-like appearance of the section. In addition to cavity formation there was a widespread bacillary thrombosis of the pial and cerebral veins, as well as a breaking-up of the glia and brain tissue proper. A formation of fat-like substances and a marked cellular reaction in the pia-arachnoid were also noted. Such changes afforded evidence of a premortal gas-bacillus infection. Hassin therefore assumes that cerebral porosis is a distinct pathological entity with histopathological features not to be found in any other infection of the central nervous system.

R. M. S.

- [53] Pupil rigidity and the ciliary ganglion (Rigidità pupillare e ganglio ciliare).—CRISTOFORO RIZZO. *Riv. di Patol. Nerv. e Ment.*, 1920, xxv, 325.

AN important paper, based on the minute histopathological examination of no less than 22 ciliary ganglia: 9 from normal individuals; 8 from cases of general paralysis, and 1 from tabes, all with Argyll Robertson pupils; 2 from general paralysis with absolute pupil rigidity, 1 from the same disease in which the pupil reactions were normal, and 1 also of the same disease in which the reactions were but slight.

In the normal ciliary ganglion there are two groups of cells, small and large: the former are round the periphery, and are some four or five times smaller than the others. Their cytoplasm stains badly, but they are always recognizable by their nucleus and by the pigment they contain. There are two varieties of pigment. One is contained in the small cells and does not tend to increase in amount, and its reactions are like those of the pigment in the substantia nigra. The other is the familiar pigment found in the large cells, which increases with the progress of disease in the ganglion.

The nerve fibres for the intrinsic muscles of the eye are much smaller than those for the extrinsic muscles, and morphologically different.

Rizzo's most important conclusion is that in no one of the ganglia coming from cases with fixed or with Argyll Robertson pupils has he been

able to detect any change of the slightest significance; any alterations, in only a few cells, of the nature of chromatolysis, have been of a somewhat acute nature, and are to be assigned to the terminal affection which has led to the patient's death.

Thus, the ciliary ganglion theory of the origin of the Argyll Robertson phenomenon, always more than unsatisfactory on clinical grounds, is definitely and finally disproved by painstaking pathological examination in a sufficiently impressive number and variety of cases.

S. A. K. W.

[54] **The dangers of lumbar puncture** (Ueber die Gefahren der Lumbalpunktion).—CARL MONAR. *Allg. Zeits. f. Psychiat.*, 1920. lxxvi, 293.

THIS is a review of mishaps attending lumbar puncture, reported for the most part by continental observers. Quinke introduced the procedure in 1891, and in 1914 he summarized his experience and laid down its indications as follows: (1) Where increased intracranial pressure threatening life may be due to increased output of fluid. (2) In similar circumstances where mental impairment and vomiting may be relieved. (3) In acute cases of serous transudation where it may produce great improvement. (4) When relapse occurs in these last cases puncture should be repeated daily at first, then with increasing intervals. (5) In these repetitions the clinician must be guided by the general course of symptoms and by the results of previous punctures. (6) On each occasion the initial and end pressure must be noted, also the quantity of fluid removed, and the patient must be treated carefully afterwards. (7) Purulent bacillary meningitis may be cured by repeated puncture, and the same favourable result occasionally occurs in tuberculous meningitis. (8) Cerebral tumours are no contra-indication, provided that prudence is employed. Good results often follow, and the optic neuritis may even clear up.

It is now known that mishaps are comparatively rare. Monar finds that in a series of 523 cases he has noted cited by different authors, only one death was reported. Death following lumbar puncture nearly always occurs in cases with cerebral tumour, particularly if situated in the posterior cerebral fossa. Eskuchen suggested, as precautions against mishap, that the minimal quantity of fluid necessary should be withdrawn as slowly as possible, and forty-eight hours' rest in bed enforced afterwards; normal saline should replace the fluid withdrawn when the tumour was in the the posterior cerebral fossa. Schönbeek's precautions were more stringent for cases of tumour: rest in bed before and after puncture, avoidance of alcohol and excitement, and gradual resumption of the upright posture. Death has followed rupture of an aneurysm of a cerebral or spinal vessel.

Unpleasant sequelæ in healthy persons were reported by Missl to consist in headache, malaise, nausea, vomiting, sometimes a passing ill-health. These lasted from one to eight days, and were exaggerated by movement. Local symptoms were rare, and lesions of the cauda equina practically unknown. Probably in most cases more fluid is removed than is actually required, and twenty-four hours' rest in bed afterwards is to be recommended.

Lumbar puncture in tabetics occasionally exaggerates the ataxia. Respiratory failure after puncture in eclampsia was ascribed by Pollack to pre-existing irreparable damage of nervous tissues. Von Lewark reported aggravation of paralyses in two cases of tumour of the spinal cord, in one of which no fluid was withdrawn. Szmurlo, Sterling, Wolff, and Hubner have drawn attention to paralyses of ocular muscles that seem to have been related to lumbar puncture performed in acute inflammatory conditions. Förster reported resumption of menstruation in one case following puncture; another patient aborted during the night succeeding it. Nonne found unpleasant sequelæ in 5 to 10 per cent of 3000 cases of lumbar puncture, among them occasionally severe meningismus. Such sequelæ were rare where organic nervous disease, apart from tumours, was present. Hysterical symptoms of all kinds may lead to claims for compensation.

Numerous observers have shown that blood-pressure falls and pulse-rate quickens after puncture, and these seem indications of improvement in cerebrospinal meningitis. All writers agree in emphasizing the care that should be taken in lumbar puncture, and the necessity for a period of rest in the horizontal position following it.

H. W. HILLS.

[55] The goldsol reaction in the cerebrospinal fluid (Die Goldsolreaktion im Liquor cerebrospinalis).—WEIGELDT. *Deut. Zeits. f. Nervenhe.*, 1921, lxxii, 290.

A LONG and somewhat elaborately technical paper on the goldsol test leads to the following general conclusions: (1) Theoretical: The reaction (G.R.) indicates with peculiar sensitiveness a pathological, colloidal change in the albumins and analogous substances, and it is practically certain this alteration in a colloidal direction is the basis of the positive results in Wassermann, Sachs-Georgi, and Meinel tests. (2) Technical: The author employs and recommends the use of a gold solution reduced by grape sugar according to the method of Eicke and others. The success of the goldsol preparation depends on the degree of neutralization: too slight 'alkalinescence' is the chief cause of poor results. Absolute cleanliness, pure chemicals, temperature, and grape-sugar solution, are in reality of secondary importance, nor is fresh redistillation of the water indispensable. (3) Clinical: Slight change of coloration in the first three or four tubes is simply a negative reaction. A positive reaction consists in a definite transition of the purple-red solution to blue, blue-white, and white. Two general types of reaction may be usefully distinguished: (1) Maximum in the 1-4 and 1-80 dilutions (neurosyphilis and disseminated sclerosis): (2) Maximum in the 1-640 and 1-1280 dilutions (non-syphilitic meningitis and cases where the fluid is contaminated with blood). The G.R. does not enable the observer to distinguish between tabes, general paralysis, and cerebrospinal syphilis, and positive results are sometimes seen in inflammatory nervous diseases and in tumours. One of its valuable features is its usefulness in showing the existence of neurosyphilis earlier than the Wassermann test, and in practically 100 per cent of cases. It is independent of the state of the blood serum.

S. A. K. W.



- [56] The compression syndrome of the cerebrospinal fluid, with special reference to Queckenstedt's symptom (Ueber das Kompressionssyndrom im Liquor cerebrospinalis mit besonderer Berücksichtigung des Queckenstedtschen Symptomes).—GROSS and PAPPENHEIM. *Deut. Zeits. f. Nervenh.*, 1921, lxxvii, 353.

THE authors describe in rather a sketchy way a series of cases (8 of thoracic, 1 of cervical, and 1 of lumbar spinal tumour, and 4 of spinal caries—2 thoracic, 2 cervical) in which the syndrome of compression in the fluid was well developed, viz., increase of albumin content and absence of cellular elements: apparently only in one was actual xanthochromia observed. In 9 of the 14 cases (4 spinal caries, 4 thoracic and 1 cervical spinal tumour) was Queckenstedt's sign definitely positive. It consists in absence, or in notable slowness of development, of that momentary increase of the pressure of the spinal fluid which can readily be demonstrated in the normal individual when the veins of the neck are compressed during a lumbar puncture. In one case it was the sole pathological sign, the fluid being normal. Unfortunately, the authors do not enter on any discussion of its pathogenesis.

S. A. K. W.

- [57] Phenolsulphonephthalein absorption from the subarachnoid space in paresis and dementia præcox.—P. G. WESTON. *Arch. of Neurol. and Psychiat.*, 1921, v, 58.

THE injection of phenolsulphonephthalein into the lumbar subarachnoid space is followed by its appearance in the urine after an interval of from four to ten minutes. Diseases of the nervous system, especially those which involve the meninges, produce a lengthening of the appearance time, which is as much as seventy minutes in some cases. The writer studied the appearance of the dye in the urine of twenty-eight cases of catatonic dementia præcox and seventeen cases of general paresis. Age, duration of the psychosis, and physical and mental condition had no constant effect on the appearance time. In all cases the appearance of the dye in the urine was delayed, the time varying from 12 to 68 minutes in the case of paresis and from 25 to 104 minutes in the case of catatonic dementia præcox. The dye was not found in fluid drawn from the cisterna magna at any time up to five hours after it had been injected into the lumbar subarachnoid space. Its absorption took place from the lumbar region.

R. M. S.

- [58] Puncture of the cisterna magna.—JAMES B. AYER. *Arch. of Neurol. and Psychiat.*, 1920, iv, 529.

THE author describes a method of obtaining cerebrospinal fluid from the base of the brain by puncture of the cisterna magna. In his hands the procedure has been found almost always easy, and no alarming symptoms have been observed, either at the time of puncture or subsequently. Nevertheless, he cautions the reader that cisterna puncture should only be attempted after preliminary practice on the cadaver. The patient is placed on one side, as if for lumbar puncture, with neck moderately flexed. The needle is inserted in the mid-line just above the spine of the axis, and



is gradually forced forward and upward in line with the external auditory meatus and glabella until the dura is pierced. In an ordinary-sized adult the needle penetrates to a depth of from 4 to 5 cm. before piercing the dura, and in this position there is usually a distance of from 2.5 to 3.0 cm. between dura and medulla. The conclusions of the author are based on forty-three punctures performed in twenty cases. The procedure was found to be of value in the diagnosis of postmeningitic subarachnoid block, and was also employed in the treatment of a selected group of cases of cerebral syphilis and in one case of epidemic meningitis. Used in conjunction with lumbar puncture it proved of value in the diagnosis of cord compression: where there is an obstruction to the free passage of fluid in the spinal subarachnoid space by tumour, Pott's disease, etc., fluids taken from above and below the site of compression may show marked chemical differences.

R. M. S.

### SENSORIMOTOR NEUROLOGY.

- [59] The coincidence of cervical ribs and syringomyelia.—PETER BASSOE. *Arch. of Neurol. and Psychiat.*, 1920, iv, 542.

THE frequent association of syringomyelia and scoliosis is well known, but the co-existence of cervical ribs with that disease has not attracted much attention, although a number of cases have been recorded in the literature. The author gives the clinical histories of three patients in whom this combination was found. Operative treatment, although successful from the surgical point of view, does not always lead to disappearance of local symptoms, and may be followed by severe hypochondriasis. Cases of cervical rib must be regarded with suspicion, and the patients accepted as possessed of well-balanced minds and structurally normal nervous systems only after close scrutiny.

R. M. S.

- [60] A case of myotonia atrophica (Untersuchungsbefund an einem Fall von Dystrophia myotonica).—MAAS and ZONDEK. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lix, 322.

IN this remarkable case the heart was dilated, its rate was slow, and electrocardiographic tracings showed an increase of the As-Vs interval in all three leads. In a footnote the authors state that they have since found the same changes in two more cases. This is apparently an entirely new observation, with important bearings on the problem of the relation between the ductless glands and the functions of the heart.

W. J. ADIE.

- [61] Extracranial injuries of multiple cranial nerves.—LEWIS J. POLLOCK. *Arch. of Neurol. and Psychiat.*, 1920, iv, 517.

IN this paper the author gives a clear and succinct account of the somewhat confusing syndromes which may arise from extracranial lesions of the last four cranial nerves, and contributes notes on three cases which came under his observation. The number of syndromes appears to be limited only by the possible combinations of complete or incomplete paralyses of these several cranial nerves, and the descriptive ability of the various observers.

R. M. S.

- [62] A new type of birth palsy mainly affecting the thoracic and scapular muscles (Ueber einen neuen Typus der Entbindungs-lähmung mit vorwiegender Beteiligung der Brust- und Schulterblattmuskeln).—II. LANGBEIN. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1920, lix, 294.

IN a boy, age 8, whose right arm had been weak since birth, the distribution of the palsy was as follows: complete paralysis, with absence of electrical excitability—serratus, rhomboids, trapezius inferior; weakness and diminished excitability—deltoid; slight weakness with normal reactions—biceps, triceps, pectoralis major, latissimus dorsi. The paralysis therefore was greatest in muscles that are usually spared in upper plexus lesions, and the muscles of Erb's group were only partially injured. A glance at a diagram of the brachial plexus will show that the injury to the roots C 5 and 6 must be higher in this case than in Erb's palsy, and above the origin of the long thoracic, dorsalis scapulae, and suprascapular nerves; that is, proximal to the point where C 5 and 6 emerge from the scalene muscles and unite to form the upper cord. According to the author the case is unique.

W. J. ADIE.

- [63] Acquired double athetosis.—W. G. SPILLER. *Arch. of Neurol. and Psychiat.*, 1920, iv, 370.

SPILLER reports a case of acquired athetosis, resembling progressive lenticular degeneration in some ways, but differing from it in its chronicity and in the absence of tremor. The patient, a girl, when about 5 years of age, was noticed to drag her left lower limb, and to have lost the use of her left upper extremity. Later, the paralysis affected other parts of the body, and assumed a spastic character: marked inco-ordinate movements were observed in the hands and feet. Articulation was difficult and defective. Forty-five years later all the limbs showed contractures, and there was some muscular atrophy. Her muscular system was in a state of continuous and universal athetosis; the lower jaw was frequently drawn down and to the left. The arms, hands, legs, and feet were most involved and to an extreme degree, the neck was less involved, and the trunk only slightly affected. There was a spastic scoliosis. The tendon reflexes were not obtained, possibly because of the spasticity. Both pupils showed myosis. Speech was peculiarly explosive and indistinct, but occasionally she was able to utter words with comparative ease and distinctness. She had difficulty in chewing and swallowing. Her mentality was poor.

At the necropsy the liver was found in a state of chronic passive congestion and red atrophy. Each lenticular nucleus was about one-half the normal size. The globus pallidus and caudate nucleus were both atrophic, but neither showed the peculiar tissue seen in the putamen. The latter had on each side a worm-eaten appearance, and contained numerous small holes. Microscopic examination of these areas showed shreds of tissue containing numerous neuroglia nuclei, with here and there a much altered nerve-cell; the blood-vessels were much thickened, and the perivascular spaces enlarged. The Betz cells of the paracentral lobules showed pro-

nounced chromatolysis. The motor anterior horn cells of the spinal cord were on the whole normal, and the pyramidal tract throughout the brain and spinal cord appeared healthy.

In an interesting discussion the author reviews extensively the literature on the various disorders attributed to disease of the lenticular nucleus. The group is a formidable one, and includes progressive lenticular degeneration, pseudosclerosis of Westphal and Strümpell, Huntington's chorea, paralysis agitans, spastic pseudobulbar palsy with contractures and choreo-athetoid movements of Oppenheim and Vogt, and Freund and Vogt, Oppenheim's dystonia musculorum deformans, double athetosis, von Bechterew's hemitonia apoplectica, certain forms of carbon-monoxide poisoning, the paramyoclonic type of lethargic encephalitis, arteriosclerotic muscular rigidity, and certain forms of senile dementia, which Strümpell thinks belong to his amyostatic syndrome.

R. M. S.

[64] *Dystonia lenticularis (dystonia musculorum deformans).*—E. W. TAYLOR. *Arch. of Neurol. and Psychiat.*, 1920, iv, 417.

THE author describes two cases of dystonia lenticularis occurring in the same family; the parents were Russian Jews. Both patients were attacked in their 7th year, but otherwise the clinical manifestations were very dissimilar.

*Case 1*, a schoolboy, age 11, appeared, on admission to hospital, quite normal except for the motor disorder, which was said to have commenced in the upper extremities. Variation in muscle tone was a conspicuous feature; some muscles were firm and elastic, others were flabby and toneless. Any voluntary movement of the body or limbs evoked an extraordinary spasm, which remained until the boy again placed himself in a position of rest. When he lay quietly in bed there was no movement of the body, but the right arm was held constantly in extension and extreme inward rotation, with wrist and fingers sharply flexed. In walking he forged forwards with the pelvis sharply tilted, head and chest thrown violently back in a position of opisthotonus, making extreme inco-ordinate choreiform or athetoid movements to retain his balance and progress. This apparently was only possible under certain circumstances by twisting the body violently. Often in accomplishing progression the patient turned half or completely round, and took a step backwards; a short distance was sufficient to exhaust the patient. The facial muscles showed neither spasm nor contortions, and electrical examination of all muscles gave normal reactions. There was no muscular atrophy, and the reflexes were unchanged.

*Case 2*, age 13, sister of the foregoing patient, was a normal child up to the age of 6. In her 7th year choreiform symptoms appeared, manifesting themselves first as a twitching of the neck, and gradually spreading to the body and limbs. Progressive mental enfeeblement was also noted, and eventually she could only utter inarticulate sounds. When the patient came under observation she was in a state of extreme emaciation and weakness. The most obvious disturbance was a constant choreiform

movement extending over the entire body and limbs. The facial muscles also took part in the involuntary movements, and she could only open the mouth by making extraordinary facial contortions. The tongue could not be protruded. All four limbs were held in a flexed position, and could not be passively extended. The disease terminated fatally, but under conditions which precluded a post-mortem examination.

The writer remarks that experience has amply shown that a syndrome, without a definite pathological anatomy and with a still less ascertained etiology, should never be regarded as a 'disease entity'. It is therefore desirable to give up for the present the attempt to circumscribe this disease further than to regard it as one of the outstanding symptom-groups of lenticular or basal ganglion disease.

R. M. S.

- [65] **The functional organization of the extrapyramidal system and the predilection-type of pyramidal paralysis** (*Die funktionelle Organisation des extrapyramidalen Systems und der Prädilektions-typus der Pyramidenlähmung*).—STERTZ. *Deut. Zeits. f. Nervenh.*, 1921, lxxvii, 481.

THE question of the possible substitution of function by some other motor tracts for that lost by complete interruption of the corticospinal system is of considerable interest. Such restitution is always incomplete. It was supposed by Mann, who emphasized the familiar predilection-type of pyramidal palsy (extensors of arm, flexors of leg), that this substitution of function affected the extensors of the leg because of their importance in standing and walking, and was procured by way of the homolateral hemisphere and the uncrossed pyramidal tract. Mann's view cannot be maintained, however, both for experimental and clinical reasons, and many others (Rothmann, Forster, v. Monakow, etc.) hold that such restitution as ensues is of subcortical origin.

The author gives in tabular form a list of symptoms of pyramidal and extrapyramidal lesions respectively, to which, however, especially in regard to the latter, much exception may be taken: notably, his contrast of the contracture-attitudes in the two cases is inaccurate and incomplete. The motor cortex proper is the seat of isolated volitional movement and of all synergies that have been acquired, as also of motor power. Such weakness as may be found in extrapyramidal disease is the result of imperfect action of the peripheral neurones. The spasticity of pyramidal lesions is the result of loss of cortical inhibition. Fine hand and finger movements, being a late acquisition, cannot be replaced, though old reflex automatisms may make their appearance again. Extrapyramidal disease brings about a fixation-reflex, agonists and antagonists being alike involved, in contradistinction to the reciprocal innervation of cortical origin. It is doubtful whether phylogenetic considerations will explain the differences between the motor symptoms of the two types of lesion. The ape is more of a cortical animal than some suppose, and analogies between the attitudes and movements of, say, infantile cerebral hemiplegia and those of the ape, do not necessarily indicate a phylogenetically old and presumably subcortical origin. The author favours the view of Rothmann, which associates the



predilection-type with the assumption of the erect attitude. Importance is attached to a diversion from the cortex, in pyramidal cases, of the normal stream of afferent impulses, which pass by a new route and awaken subcortical activity. It is assumed that the subcortical or extrapyramidal motor system serves ordinarily to support or reinforce, and not to counteract, the activity of the main corticospinal system.

S. A. K. W.

- [66] **Mental disorders in children following epidemic encephalitis.**—S. R. LEAKY and I. J. SANDS. *Jour. Amer. Med. Assoc.*, 1921, lxxvi, 373.

THE original optimism as to complete recovery in non-fatal cases of this disease has not been justified by experience, and consideration of the intensity of the pathological changes involved makes it unlikely that this should be so. Not only have somatic sequelæ occurred, but abnormalities in the behaviour of the individual have been noted. In a group of six children, four boys and two girls, age 5 to 14½ years, who had passed through an attack of encephalitis with complete somatic recovery, the following mental abnormalities were noted. Their mental status was characterized by purposeless, impulsive motor acts, marked irritability, definite disorders of attention, distractibility and changing variable mood, inadequate and inconsistent emotional reactions, marked insomnia, and, in two cases, precocious sexual feelings and intense eroticisms. The authors consider these changes, which are elaborated in the case-histories accompanying the article, are the result of purely physical changes which result from the destruction of some nerve-cells and the irritation of others by the prolonged resolution of mesodermic inflammatory reactions.

Drug treatment was not found efficacious; but hydrotherapy, suitable light occupation, and a general non-stimulating régime helped the patients considerably.

R. G. GORDON.

- [67] **Choreo-athetoid and choreopsychotic syndromes as clinical types of sequelæ of epidemic encephalitis.**—LA SALLA ARCHAMBAULT. *Arch. of Neurol. and Psychiat.*, 1920, iv, 484.

THE writer lays stress on the remarkable protean symptomatology in epidemic encephalitis, which he suggests is dependent on regional variations in the focal predominance of the underlying histological changes. The combination of choreiform twitehings and acute psychotic disturbance as the salient manifestations is not uncommon, and choreo-athetoid or frankly athetoid syndromes may be observed as sequelæ of the disease. Variations in the symptomatology of epidemic encephalitis are possibly due to individual variations in the relative susceptibility of different levels of the cerebrospinal axis, and it is suggested that regional exhaustion from prolonged physiological hyperactivity or from previous disease may be an important factor in the localization of lesions produced by infections of the central nervous system.

Perusal of this paper will repay the reader, although it cannot be said to add much to our knowledge of epidemic encephalitis.

R. M. S.



- [68] **Epidemic encephalitis. Residual symptoms, chronicity, and relapsing tendency.**—F. A. ELY. *Jour. Nerv. and Ment. Dis.*, 1921, liii, 119.

THE author quotes cases to show how relapses may occur and how a chronic state of invalidism and fatigability may be induced. He concludes that : (1) Not all cases of epidemic encephalitis die or recover. Some drift into a subacute or chronic state which lasts many months. In some cases a distinct relapsing tendency may be observed, in which newly-localized symptoms may appear, and in which an almost typical recurrence of the symptoms observed at the onset may be reproduced. (2) The irritant causing the root pains and myoclonic muscle-contractions of epidemic encephalitis undoubtedly involves successively different segmental levels of the cord or its corresponding nerve-roots, giving rise to descending and ascending forms of radiculitis. (3) The motor nuclei and roots of the cranial nerves are not immune to the irritant which causes symptoms of radiculitis in the various spinal levels of motility. (4) Even the most mild attacks of epidemic encephalitis frequently leave the afflicted person incapacitated for full participation in his work for many months. (5) The symptoms of epidemic encephalitis are protean in character, and tend to prove that both the central and peripheral nervous structures are susceptible to some irritant generated by the invading micro-organism.

R. G. GORDON.

- [69] **The frequency of albuminuria with casts in epileptics following convulsive seizures.**—NATHAN NOVICK. *Arch. of Neurol. and Psychiat.*, 1920, iv, 546.

THE presence of albumin with casts in the urine voided immediately after epileptic attacks has been variously accounted for : by some it is regarded as due to admixture of semen liberated by pressure on the seminal vesicles ; by others it has been attributed to muscular contractions. Novick, who investigated the urine in a series of 60 cases of epilepsy, reached the following conclusions : (1) In the series, 66 per cent showed albuminuria with granular casts after every seizure. Two cases, diagnosed clinically as hysteria, gave no evidence of either albumin or casts in the urine after repeated examinations following epileptiform seizures. (2) Albuminuria with casts persists for from twenty-four to forty-eight hours subsequent to attacks in some genuine epileptics. (3) The frequency of seizures, while apparently holding no relation to positive urinary findings, tends in general towards regularity of urinary abnormalities after attacks. (4) The duration of seizures seems to bear no relation to subsequent albuminuria. (5) Seminal fluid as a contamination factor giving rise to albuminuria after epileptic seizures does not play a very great rôle.

R. M. S.

- [70] **Wounds of the head and compensation laws.**—CHARLES L. DANA. *Arch. of Neurol. and Psychiat.*, 1920, iv, 479.

THE syndrome of non-fatal, non-destructive wounds of the head is quite a definite one, and is a picture of a generalized traumatic neurosis or psychoneurosis with certain head symptoms which have a possible legitimate

basis. Prominent among the latter are headache, vertigo, insomnia, irritability, anxiety, depression, memory defects, fatigability, tinnitus, partial deafness, and loss of weight. Dana makes the following classification: (1) In about 10 per cent of compensation cases with head wounds the patient has the main features of the syndrome, and is just made uncomfortable by it, but there is no constitutional disturbance of the nervous centres. (2) In more than half the cases the patient is anxious, worried, nervous, and depressed, and cannot concentrate or work. He becomes self-centred, exaggerates, and refuses to attempt to work or to do anything but wait for some new treatment that will make him well. (3) In another large percentage of cases a definite attitude of exaggeration or plain malingering develops.

When the question of compensation is settled the symptoms do not always disappear, and in similar head injuries in non-legal cases they may continue and even grow worse. Such cases can hardly be considered victims of neuroses or psychoses. They are suffering from traumatic conduct disorders or from antisocial reactions to a painful or incapacitating injury. Many patients can be relieved entirely if properly and skilfully handled, but re-educational and reconstructive measures must be employed early and energetically. The patient must be told emphatically that his functional troubles will receive no recognition as a permanent disability.

R. M. S.

[71] A clinical and anatomic study of a vascular lesion of both cerebellar hemispheres.—WALTER F. SCHALLER. *Arch. of Neurol. and Psychiat.*, 1921, v, 1.

THE report of a case in which there was destruction of tissue in both cerebellar hemispheres, with conservation of the vermis and vestibular system. The patient, a man, age 58, had a 'stroke' which rendered him practically helpless owing to great motor inco-ordination in all extremities, especially in those of the left side. When seen three years later there was no disturbance of intelligence or emotion. Speech was typically scanning. The patient could scarcely stand even when assisted, and was quite unable to walk; yet he was able to sit upright for hours at a time without discomfort or difficulty. Analysis of his disturbed co-ordination showed the presence of dysmetria, dysdiadochokinesia, and dysynergia: all more marked on the left side. The most striking symptom was that of cerebellar catalepsy. When the patient lay on his back, with the thighs adducted and flexed on the pelvis, and the legs flexed on the thighs, after a few unsteady movements, a remarkable immobility of the lower limbs ensued. Hypotonia was not noted, and muscular force was well preserved. There was no constant tendency to deviate in Bárány's pointing tests, and no spontaneous nystagmus.

The patient died suddenly, and the brain and cord were alone examined. Transverse section of the cerebellum revealed the presence of old symmetrical areas of softening in the central white matter of both hemispheres; on the left side the destruction of tissue was greater, the dentate and roof nuclei being destroyed. Three other lesions were

encountered, the highest being situated in the right crista. Further examination showed a practically complete degeneration of the left superior peduncle, degeneration of the right red nucleus and in Forel's field, also of the left restiform body, and of the right inferior olive. A tract of degeneration on the left side of the spinal cord was identified as Hellweg's bundle. The absence of nystagmus in this case was explained by the practically intact vestibular system, and the conservation of static equilibrium by the normal condition of the vermis. The destruction of the left restiform body was regarded as being related to the lesion of the left dentate nucleus, and the author suggests that the central tegmental tract, circumolivary fibres, internal fibres of the olive, and Hellweg's bundle are more or less intimately connected with each other.

R. M. S.

### NEUROPHYSIOLOGY.

- [72] The action of certain drugs on brain circulation in man.—  
T. RAPHAEL and JAMES M. STANTON. *Arch. of Neurol. and Psychiat.*, 1919, ii, 389.

THE subject of the pharmacological investigations was an adult male who developed two large pulsating cerebral herniæ after double subtemporal decompression. By enclosing the right hernial mass in a plethysmograph, satisfactory pulse-tracings were obtained. The exhibition of amyl nitrite caused a marked dilatation of the brain-vessels. Epinephrin induced a primary constriction, followed by a marked dilatation. Caffeine administered intravenously produced no demonstrable change. Pituitary extract caused a dilatation of the brain-vessels which was accompanied by a distinct general pallor of the face—the so-called 'leuko-reaction'.

R. M. S.

- [73] The oculocardiac reflex (Dagnini-Aschner phenomenon)—its use in medicine and psychology.—SANTE NACCARATI. *Arch. of Neurol. and Psychiat.*, 1921, v, 10.

COMPRESSION of the eyeball causes a slowing of the radial pulse, together with lowering of blood-pressure and modification of respiratory rhythm. This phenomenon was first reported by Dagnini, and later in 1908 Aschner published a paper on the same subject. Since this date the reflex has been investigated in many diseases, with somewhat conflicting results. It is customary to speak of a normal oculocardiac reflex when the pulse is retarded 5 to 12 beats per minute. When the pulse is reduced more than 12 the reflex is exaggerated. When the retardation does not exceed 4 the reflex is abolished. When, instead of retardation, acceleration occurs, the reflex is inverted. The use of the terms 'normal', 'exaggerated', or 'inverted' is somewhat misleading and ambiguous, and Naccarati suggests instead that the difference in one minute between the pulse-rate without ocular pressure and the pulse-rate with pressure be always indicated in full with a positive or negative sign. This algebraic difference should be called the reflex index. The pulse-rate should also be given, as the value of a reflex index is not absolutely the same in a bradycardiac as in a tachycardiac.

The author investigated 165 normal and 336 abnormal individuals, and found that the oculocardiac reflex is subject to individual differences and variations, as is the pulse. About 4 per cent of normal subjects showed a reflex index of from 0 to  $\frac{1}{2}$  4. In tabes the reflex index is 0 or very small; exceptionally it surpasses three units. In general paresis the index tends to remain small, but cases showing a larger positive or negative index are encountered with much more frequency than in tabes. In the feeble-minded no tendency to a large positive index was found, as reported by some authors. In epilepsy, although a well-defined tendency towards a large positive index was found, it was not the rule. In thyroid states a definite tendency was found on the part of hypothyroid patients to react with a positive index, and of the hyperthyroid patients to react with a negative index.

Investigation of the reflex in cases of unilateral cranial-nerve palsy substantiated the results of Asehner's experiments on animals—the centripetal pathway of the oculocardiac reflex is constituted exclusively by the sensory branch of the trigeminal nerve, the centrifugal pathway mainly by the vagus and partially by the sympathetic nerve.

R. M. S.

#### VEGETATIVE NEUROLOGY AND ENDOCRINOLOGY.

[74] Recent studies on the pineal gland (*Neue Studien über die Zirbeldrüse*).—OTTO MARBURG. *Arb. a. d. neurolog. Inst. a. d. wien. Univ.*, 1920, xxiii, 1.

This paper is a reprint of the inaugural address given by Professor Marburg on taking up his duties as the new director of the Neurological Institute in Vienna. It contains a complete summary of our knowledge of the pineal gland and of the structures in its neighbourhood, and is enriched by an account of contributions to the subject which the author has made during the last twenty years.

After René Descartes deposed the gland from its position as the seat of the soul, little attention was given to this part of the brain until some two hundred years later, when Leydig, in 1868, observed in reptiles and amphibians the organ now known as the parietal eye. At once interest revived, and when the author began his studies the anatomy of this region in lower animals had been fully worked out. The structures discovered were from before backwards: (1) The paraphysis; (2) The dorsal sac; (3) The commissura habenularum; (4) The parietal eye and the nervus parietalis which arises from the parietal ganglion in the commissura habenularum; (5) The pineal body (which is quite distinct from the parietal eye); (6) The commissura posterior, and on its under-surface the subcommissural organ, from whose ciliated epithelial cells arise the fibres which unite to form that remarkable structure the fibre of Reissner. The connection between the subcommissural organ and Reissner's fibre in higher mammals has been demonstrated clearly (Kohner, 1918): the paraphysis has been seen in the human embryo (Hochstetter, 1919), and the nerve to the parietal eye has been found in the antelope (Marburg, 1920). The structures present



in saurians, therefore, are also present in mammals, the parietal eye being represented by a rudiment, the *nervus parietalis*.

Marburg failed to find the pineal body in several mammals, but is inclined to attribute this to faulty technique. On the other hand, he found the subcommissural organ in every one of the fifty-four orders he examined, and noticed that it was often large when the pineal body was small. He gives a detailed account of the varying size of the gland in a large number of animals. From this, one point of general interest emerges, namely, that it is absent or very small in those with a hard covering—elephants, crocodiles, etc.—while it is largest in the horse and in other animals with a rich blood-supply to the skin. This, together with his experimental and clinical observations, has led the author to believe that the pineal secretion has an influence on vasomotor nerves and is concerned in the mechanism of heat regulation.

A critical review of the published cases of tumours of the pineal body follows. In most cases, but not in all, the tumour was a teratoma. These cases prove that involution of the gland is associated with sexual maturity, and that early involution causes sexual precocity. This precocity is found in boys only, and is greatest between the ages of two and eight years. From eight to sixteen early breaking of the voice, hairiness, and other secondary sexual characteristics may appear early, but hypertrophy of the genitals is not so striking. It appears, therefore, that the pineal secretion influences the interstitial cells of Leydig as well as the development of the male sexual apparatus.

The relation of the pineal body to certain psychical and metabolic disorders is discussed.

The subcommissural organ is present in man and in almost every animal. It is an organ of sense, with cells resembling those of the vestibular apparatus. It has wide connections with the brain through the *fasciculus subcommissuralis*, and with the spinal cord as far as the *filum terminale* through Reissner's fibre.

The various functions which have been attributed to it are mentioned, the author favouring the view that it is concerned in the regulation of changes in the pressure of the cerebrospinal fluid.

This brief abstract does scant justice to a paper which deals fully with every aspect of a subject by one who has taken an active part in its development. The bibliography gives a list of over one hundred papers.

W. J. ADIE.

[75] Experimental researches on the pituitary body.—CAMUS and ROUSSY. *Endocrinology*, 1920, iv, 507.

THE animal used was the dog. Partial and complete hypophysectomy was often followed by severe polyuria, but only when the base of the brain was injured accidentally or otherwise. Following on these results it was found that injury to the base of the brain with a heated needle, the pituitary remaining intact (confirmed by post-mortem examination), induced a polyuria of varying duration, from fifteen days to seven months, and one which is uninfluenced by the exhibition of pituitary extracts. "It seems



that the optopeduncular region alone marks the zone within which a lesion is followed by polyuria: it lies at the level of the tuber cinereum in the vicinity of the infundibulum." From the fact that the polyuria may occur without an increased intake of water, at least for the first few days, the authors conclude that the polyuria is the cause and not the result of the polydipsia. In many animals the intake and output of water did not run parallel, indicating some disturbance of the regulating mechanism.

The authors also found that genital atrophy only occurs after hypophysectomy when the base of the brain is injured.

As regards glycosuria, only 6 dogs out of 45 presented this condition, and in at least 4 out of the 6 basal injuries were found post mortem. In all cases the glycosuria was mild and fleeting, and injections of pituitary extracts in the animals operated upon did not sensibly affect the limit of tolerance to carbohydrates.

The paper, which is well illustrated, deals with the actual facts observed, and hypothetical considerations are altogether avoided.

J. L. BIRLEY.

- [76] A case of acromegaly associated with brain tumour.—W. A. BRYAN and S. UYEMATSU. *Arch. of Neurol. and Psychiat.*, 1921, v, 20.

THERE are in the literature many cases of acromegaly with cerebral tumour situated in the neighbourhood of the pituitary body, or at some distance from it. The question arises, Are the tumours found in these cases accidental, or are the acromegalic symptoms dependent on pressure, with resultant biochemical changes? From a study of such a case Bryan and Uyematsu conclude that cerebral tumours may cause symptoms of acromegaly in an indirect manner. The patient, a man, age 50, displayed typical symptoms of acromegaly over a period of eighteen years. Four years before death he showed exophthalmic goitre and other symptoms of hyperthyroidism. Temporary relief followed a transsphenoidal operation and radium treatment. At the autopsy a large meningeal endothelioma was found, pressing down the right parietal region, and flattening the third ventricle. The pituitary gland was only slightly enlarged and retained its original form. It showed on microscopical examination an adenomatous transformation, which was regarded not as malignant, but as an extreme hyperplastic condition.

The authors maintain that in this case the cerebral tumour was in all probability the cause of symptoms of acromegaly. First, the pituitary body was attacked through pressure on the hypophyseal fossa: thereafter the other endocrine glands became involved in consequence of the altered functions of the pituitary, with a resultant clinical picture of exophthalmic goitre.

R. M. S.

- [77] The influence of the thyroids on the functions of the suprarenals.—P. T. HERRING. *Endocrinology*, 1920, iv, 577.

THIS paper constitutes a review of recent work on a subject which is still far from being completely elucidated. For example, widely divergent

opinions are held as to the importance of adrenalin in physiological activities; the earlier investigators perhaps tended to exaggerate the rôle played by this substance. Stewart and Rogoff, on the other hand, are inclined to belittle its importance, while Cannon thinks that it acts chiefly in emergencies.

The balance of experimental evidence favours the view that the administration of small doses of thyroid in healthy animals is followed by hypertrophy of the suprarenals, especially of the cortex, while the adrenalin load of the chromophile tissues is increased. No increase in the adrenalin content of the blood has been satisfactorily established in conditions of hyperthyroidism; this may or may not be due to the fact that the biological methods for determining the adrenalin content are not strictly reliable. The effects on the adrenals of hypothyroidism are indefinite and inconclusive.

There is a large amount of evidence that the secretion of the thyroid has a sensitizing action upon the structures stimulated by adrenalin, the action not necessarily being a specific one. In this connection it has been suggested by Asher and Flack that the phenomena of Graves' disease can be ascribed to the action of adrenalin upon structures which have been sensitized by the existing hyperthyroidism.

The author regards it as probable that the effects of hyperthyroidism on suprarenal activity are due rather to changes in general metabolism than to some specific influence exerted by one endocrine gland upon another.

J. L. BIRLEY.

[78] **The internal secretion of the testis.**—ALDO MASSAGLIA. *Endocrinology*, 1920, iv, 547.

THE experimental investigations recorded in this communication were carried out before the war. The animal used was the rooster, on account of its well-marked secondary sexual characteristics. After removal of one testis and ligation and resection of the opposite ductus deferens, the testis, with or without preceding swelling, becomes atrophic, with increase of its interstitial tissue and degeneration of the seminiferous tubules. There is no change, however, in the secondary sexual characteristics, and the interstitial or Leydig cells are unaffected. Removal of the atrophic testis is followed by rapid loss of secondary sexual characteristics. These results are identical with those obtained in rabbits by Anel and Bonin in 1904.

No changes are found in the hypophysis after ligation, but castration is followed by hypertrophy of the pituitary and increase of its eosinophil cells, as previously recorded in 1905 by Fischera.

Peritoneal grafts of testicular tissue were rarely successful, and led to no important results.

J. L. BIRLEY.

#### TREATMENT.

[79] **A support in facial-nerve paralysis.**—N. S. YAWGER. *Arch. of Neurol. and Psychiat.*, 1920, iv, 659.

THE author suggests the following simple device for supporting the paralyzed cheek in the acute stage of facial palsy. A strip of adhesive plaster

about  $1\frac{1}{2}$  in. wide and  $1\frac{3}{4}$  in. long is applied to the scalp well up on the temporal region. Next, a similar strip 2 in. in length is folded at one end for about  $\frac{1}{4}$  in. as reinforcement, and into this two perforations are made. Another strip about 3 in. long is reinforced as before and correspondingly perforated: its other end is divided longitudinally for about  $2\frac{1}{4}$  in. Finally, two cords are inserted vertically into the four perforations, and the device is then ready for use.

The support is applied by firmly pressing the smaller strip over the permanent one already adherent to the temporal region, adjusting the divided one to the sagging cheek, and then approximating the free ends by tying the cords securely. The space intervening between the two strips affords freedom from pressure on the wrinkles necessarily caused by elevation of the cheek. Such a facial splint is adjustable, comfortable, inexpensive, and easily removed and renewed. It lessens the mechanical difficulties which arise in talking and mastication, hastens recovery by removal of strain, and blocks the intermittent tug from the sound side.

R. M. S.

[80] Radium treatment of tumours of nerve tissue. A discussion before the New York Neurological Society.—BAGG, EWING, and QUICK. *Jour. Nerv. and Ment. Dis.*, 1921, liii, 127.

EXPERIMENTS are described on the reaction of healthy nervous tissue to radium emanations. These showed that the healthy brain was relatively resistant, whether to radium actually implanted or to strong radiations through the scalp. For treatment of new growths, application of heavily-filtered radium, or the burying of small quantities of unfiltered radium in the tumour, are the methods recommended. The tumours most likely to be favourably influenced are those with embryonic cells and blood-vessels and little connective tissue. Gliomata, therefore, should theoretically be specially suitable for treatment. The clinical results are so far doubtful, and in the discussion various observers were not impressed by the use of radium in gliomata.

Frazier's conclusions seem to indicate the general position. These are: (1) That radium will retard the growth of endotheliomata; (2) That there is no evidence warranting the assumption that radium influences the course of gliomata; (3) That radium has proved effective in lesions of the pituitary body; (4) That radium is now employed (*a*) as a prophylactic against recurrence always after the removal of the growth, (*b*) as a prophylactic against recurring visual disturbances after sella decompression, (*c*) as an active agent by direct implantation in all inoperable growths exposed on the operating table, (*d*) as an inactive agent by indirect application in all inoperable growths.

It is best to give an under-dose by implantation, and to supplement this by cross-firing from the outside of the head.

R. G. GORDON.

## Psychopathology.

### PSYCHOLOGY.

- [81] A linguistic factor in English characterology.—ERNEST JONES.  
*Internat. Jour. of Psycho-analysis*, 1920, iii, 256.

GREAT significance is given by primitive races to words, and especially to names, and children treat words as objects in their various games. Illustrations are cited where the act of thought or speech is psychologically the full equivalent of the actual deed.

Words originally possessed motor and perceptual qualities which they gradually lose more or less completely in the course of mental development. Obscene words, probably because of their being excluded from the usual amount of development, still retain these qualities. Ferenczi remarks that a word of this kind "has a peculiar power of compelling the hearer to imagine the object it denotes in substantial actuality". He calls attention to the fact that delicate allusions to the same ideas, and scientific and foreign designations for them, do not have this effect, or at least not to the same extent as the words taken from the erotic vocabulary of one's mother tongue. The embarrassing feelings aroused by vulgar, familiar words can be avoided by the use of foreign, unfamiliar, or abstract words. In purely abstract thought the motor and perceptual elements disappear altogether. This process of abstraction effects a great economy in thought and, because of the inhibition of feeling, of emotional energy. When there is need to express unusually strong feeling, resource is commonly had to the use of just those words which have retained their motor and perceptual elements, as in oaths and obscene language. Where it is necessary to inhibit feeling, abstract or less familiar words are used.

The writer thinks that the English characteristics of propriety, prudishness, reserve, the horror of self-display and of betraying emotions, etc., must be favoured by the forces which make for repression and inhibition. He suggests that one of these is the ease by which the English can give vocal expression to forbidden ideas in a way that inhibits the development of feeling. The Saxon and Norman languages gradually coalesced to form English, but even to this day there is a difference in the 'feel' of the words belonging to each, and still more between words of Saxon origin and those more recently introduced: e.g., the Saxon swine-flesh and the Norman pork; belly and abdomen. We are thus able to indulge in fastidiousness to a degree not open to any other nation.

C. W. FORSYTH.

- [82] How 'stimulus and reaction' explains levitation dreams.  
—LYDIARD H. HORTON. *Jour. Abnorm. Psychol.*, 1920, xv, 11.

THE author in this article brings to a close a series of speculations as to the genesis of dreams. He conceives that there is a fallacy in the methods of Freud and Jung. He thinks that there is a desire to make something out of a dream at all costs, and calls this desire a 'will to interpret'. Those who are determined to find a sexual content in the dream will find it, but it is just as easy to give a gastronomical interpretation. The successes of



Freud and Jung are successes of personal skill in spite of, rather than because of, their theories. The author's standard of interpretative rectitude is the reconstitution of the train of thought in terms of 'situation and response'. His view is that dreams are mental reflections of physiological changes, which may be initiated within the organism, or in response to sensory stimuli. For instance, in the dream of "the angry sheik", the coldness and haughty demeanour of the lady is related to a chilliness of the skin of the dreamer, and the general attitude of anger of the sheik is related to the diffused sensations typical of adrenin stimulation. The several images of the dream panorama are conceived as being produced only under the influence of such stimuli acting on a pre-existing state of mental preparation. A further example may be given: "*Steps* really signify *heart-beats*, and are only sure annunciators of sex experience provided 'one's heart going pit-a-pat' happens to have been exclusively related to love—which is impossible." Flying phantasies are also explained in terms of non-sexual physiological processes set up in sleep. Thus the crude sensation animates, as it were, the handiest mental content which might be said to embody 'the idea' of the crude sensation. According to this view the determining factor is the physiological process. The mental accompaniment is therefore psychologically fortuitous and nugatory. The psycho-analytic offering is inadequate from the standpoint of pure science. It can from the practical standpoint be useful in clinical work in so far as 'talking points' can be extracted from dreams. The author therefore looks upon it as a method of suggestion. In effect, he denies that unconscious phenomena in themselves have any significance for human conduct.

JAMES YOUNG.

[83] An outline of the idea of rebirth in dreams.—MAURICE NICOLL.  
*Brit. Jour. Psychol. (Med. Sect.)*, 1921, i, 125.

NICOLL believes that the rebirth theme is the basis of our psychic life. There are certain periods of life—puberty, for example—when biological transformations, which entail a new attitude to life, are acting as forces from within. At these times especially, though at all others when a re-adjustment of values is requisite, dreams of rebirth are common. The symbol is energy in the unconscious, and the repression is not of the past but of the future. Whenever we begin to see rebirth symbolism in dreams, we must suspect the existence of a crisis in the patient's history.

The movement towards the mother is but the first act; to consider it concretely as the expression of an incest wish would be horizonless and blot out its ultimate significance, which is an attempt at regeneration. The second act is a lying in the womb. Here associations are very important for determining whether that which lies in the womb—the baby—represents the new function or merely infantility: psychological bondage. The treatment by the unconscious of the third act—emergence from the womb—is extremely complicated, but invariably shows that something is to be gained after rebirth. To remain in the mother would be disastrous, as disastrous as it was to Oedipus, who blinded himself. The old authority



(psychological father) has to be overcome before the new, more individual way of thinking (psychological mother) can be reached. This entails sacrifice of that part of the libido which is fixed to old ways of thinking and feeling.

Rebirth is expressed in as many ways in dreams as in mythology, and Nicoll interestingly makes some comparisons. The paper treats its subject matter entirely from the standpoint of the Zurich school.

ALFRED CARVER.

- [84] **Œdipus and the Sphinx.**—THEODOR REIK. (Abridged translation from *Imago*, vi, by CECIL M. BAINES.) *Brit. Jour. Psychol. (Med. Sect.)*, 1921, i, 181.

THE article makes an exhaustive attempt to solve the riddle of the being of the Sphinx itself. Reik recognizes that no explanation can be complete which fails to take into account the origin and evolution of the sphinx, and at the same time to render comprehensible all its striking and essential features. Pursuing this method of investigation, Reik shows how the sphinx comes in the process of its evolution to represent, by its composite features, animal, man, and God. Originally a forbidding totem animal, it develops, in the anthropomorphic period, into a representation of the deity. Following the patriarchial period—when it had exclusively male characters—it assumes during the matriarchial period some of the gentler features of the mother. It continues to retain its animal body as a token of its dangerous character, though now its wings bear witness to its celestial significance, and its bisexual nature to contributions from both patriarchial and matriarchial periods of religion. Thus finally the symbol stands not only for the original totemistic deity, but also represents both homosexual and incest tendencies.

The sphinx episode is the kernel of the Œdipus myth. Were it stripped from the story, there would remain only the crude life and deeds of one who committed parricide and incest; his fate would arouse no deep feeling of sympathy. But when crudely sexual themes are freely treated in myth, it implies that other motives are hidden, and the one sexual theme serves to hide another part of the content, which has some sexual or more sinister motive.

The sphinx episode as we now have it is a wonderful piece of condensation, accomplished by many generations, which has compressed the slaying of the totem god and of the father and the rape of the mother into a single deed wrought upon the sphinx. Religious, homosexual and heterosexual, sadistic and masochistic impulses pass into one another undistinguished and indistinguishable: for Œdipus in killing his father committed rape upon his mother, and assaulting his mother had for love object his father, and in both acts violated human and divine law.

The germ of the Œdipus myth is the same as that of the Biblical Fall of Man. In the latter tradition of the Tree of Life precisely the same condensation has taken place, and the tree plays a similar apparently non-essential rôle.

ALFRED CARVER.

- [85] **The infantile psyche: with special reference to visual projection.**  
—DAVID FORSYTH. *Brit. Jour. Psychol. (Gen. Sect.)*, 1921, xi, 263.

THE author reports some conclusions to which observations on children have led him. He considers that the visual type of thinking alone obtains in early life. This is in keeping with the fact that recall of infantile memories is pictorial in form, and that the dream also regresses to this method of representation. Visual memory, with its associated emotional component, can be activated either by a repetition of an external stimulus or from within. This activation of a memory by inner excitement explains several psychic phenomena grouped together under the term 'imagination'. The image is associated with an affect, and in the case of internally excited images the hallucination owes its revival to the prevalent feeling-tone of the moment. As the feeling is genuine, the hallucination, which is called up by it and projected, is accepted as equally real, and by rationalization comes to be regarded as the cause of the feeling. The mind then endows the projected image itself with feeling. The sequence of events may be illustrated as follows: (1) Fear begins to stir in a child: (2) This activates memories already associated with fear: (3) These impressions are projected: (4) The hallucination is now regarded as the cause of the fear: (5) The whole is capped by a false explanation, namely that the hallucinated figure is animated by hostile intentions: i.e., the projected feeling must account for the internal feeling.

The infantile psyche is totally unable to distinguish between psychic and external reality, and is given over to the pleasure principle. This probably is at the root of the belief in magic, spirits, and the all-mightiness of thought as illustrated by the work of Freud, Ferenczi, and Fraser. It is only by familiarity (repeated experiences) that the individual comes to differentiate psychic from objective reality. Darkness is the most favourable condition for the projection of visual imagery, and this probably accounts for the fact that adults generally see apparitions at night, or in gloomy places, and that children so frequently are afraid in the dark.

ALFRED CARVER.

- [86] **The rudiments of character.**—DAVID FORSYTH. *Psycho-analytic Rev.*, 1921, viii, 117.

To understand the adult, the main facts of infantile psychology must be established and the earliest manifestations of nervous children studied. In childhood the emotions are uncontrolled, and the experiences of early years must fundamentally influence the adult character. In fact there is nothing in adult psychology which is not derived from some childhood element. Birth is regarded as a psychic trauma, so that the infant wishes to return to its intra-uterine nirvana, but establishes its earliest contact with the external world by means of the *nutri-excretal zones*. By their agency it gains its primal notions of the world. They are: (1) Oral zone; (2) Urethral zone; (3) Anal zone; (4) Respiratory zone. This last the author specially adds, and wonders it has been overlooked, as it shares the same features as the others, i.e., a communication with the exterior by means of a sensitive mucous passage, feelings of emptiness or distention,

an object stimulus giving pleasurable sensations, and no adequate stimulus causing anxiety. Attention is drawn to several points which render this zone of importance.

Forsyth recognizes three distinct stages in the early development of the infant mind: (1) *A vegetive stage* of intra-uterine life when the organism receives all bodily needs without effort; (2) *A nutri-excretal stage* when the sensitive zones become the seat of peripheral excitations which activate the psyche; (3) Where a less important source of excitation, the skin, is added, and also sight and hearing, which are responsive to 'external stimulation' and permit of 'external projection'. It is the increasing dependence on the external which develops the personality. The vegetive or nirvana principle functions only as a regressive tendency through life, as realized in psychogenic epilepsy. Short of this, dreams and other wish-fulfilling structures may be sought for relief.

Love and hate, which are the two emotions first to find special expression, are then discussed. Love is the feeling bestowed on an object which can satisfy a bodily want and relieves tension. Love of the mother is a transference of the love of the nipple and milk stimulating the oral zone. The original objects between which an infant's love is distributed are milk, urine, faeces, breath, and according as one or other of these objects happens to receive more than its usual share of affection, the future psychical development will be modified even profoundly. Milk is an external object and tends towards 'extroversion of love', while in the case of faeces and urine the direction is towards 'introversion'. This may tend towards a failure in the development of a proper sense of the relation to the outer world as seen in dementia praecox, the earliest symptoms of which may be seen in children two years old. If epilepsy indicates a faulty transition from the vegetive to the nutri-excretal stage, dementia praecox represents a failure in passing from the nutri-excretal stage to the stage of external projection. Hate indicates disappointed love, and goes to that object which does not relieve tension. The primal hate-objects are the primal love-objects, and we may have adult characteristics according to which were in the foreground. We have therefore *oral love*, with its impulses to eat, bite, embrace, which finds outlet in active expressions of feeling which seek to master the love object. *Anal love*, in which the voluntary sphincter relaxes at the pressure of involuntary peristalsis, and which develops into the more submissive characters gratified by yielding to the love object. *Oral hate* impels the removal (death) of the object, and vomiting and disgust have intimate relationship thereto. *Anal hate*, which carries with it the wish to retain (holding back faeces) makes its contribution to character in the form of obstinacy. Volition is thus recognized as a form of nutri-excretal excitation, more particularly relating to the anal zone. In adult life, anal hate and anal love remain as obstinacy and suggestibility. The conjunction of the two in one personality is seen in the association of the states of catatonia and catalepsy which are characteristic of dementia praecox. The anal pleasure derived from the passage of constipated motions is the beginning of the 'masochistic tendency', and, later, this may be projected externally as 'sadism'.

C. STANFORD READ.

## PSYCHOSES.

[87] Influenza and melancholy.—K. A. MENNINGER. *Jour. Nerv. and Ment. Dis.*, 1921, liii, 257.

THE author summarizes the literature on the subject thus: (1) Many people, after influenza, experience an emotional depression with more or less general psychic depression for a greater or shorter period of time, but which is usually not severe enough to be regarded as a psychosis or even as a neurosis. It was ascribed thirty years ago by Church to cardiac incompetency, and since then by divers writers to various physical inadequacies, the most recent of which has been hypo-adrenalism. It is generally agreed that it consists in feelings of lassitude, weakness, fatigability, incompetence, irritability, and melancholy. (2) After the influenza epidemic of 1890-2 there were many cases of psychoses in which depression was a pre-eminent symptom, and although it is scarcely likely that all of the cases which were given the name melancholia wholly deserved it, it is possible that there were relatively more cases of 'manic-depressive psychosis' than have been observed following the recent epidemic. (3) Depression has not been a frequent symptom in the psychoses subsequent to the recent influenza epidemic, nor has the manic-depressive psychosis been even a relatively frequent form of disease entity. The great mass of literature agrees on this point.

He points out that depression is either a phase of the manic-depressive or cyclothymic psychosis, or symptomatic in such conditions as paresis, cerebral tumour, etc. He quotes eighteen cases, and concludes that: (1) The question of emotional pathology as the product of influenza is a point of much practical and theoretical interest. (2) Depression has been regarded as an almost universal sequela of influenza, but upon analysis it appears that three distinct types of depression should be recognized. (3) First, there are the mild syndromes frequently seen by the general practitioner in normal individuals for some time after the attack of influenza, and variously ascribed in the literature to cerebral toxæmia, cardiac incompetence, and hypo-adrenalism. These never, or rarely, become severe enough to be regarded as psychoses. Aside from these, the number of cases of post-influenzal depressions is remarkably small. (4) Secondly, there are severe depressions even reaching the frankly psychotic degree, and frequently terminated by suicide, which, because of more or less obvious dependence upon some gross physical pathology such as cerebral hæmorrhage, tabes dorsalis, exhaustion, etc., might be adequately called reactive or symptomatic depressions. The literature would indicate that these were far more frequent after the influenza epidemic of 1890-2 than they had been in the recent waves of influenza. (5) Thirdly, instances of manic-depressive psychosis of typical forms (manic, mixed, and depressed) may be precipitated by influenza either as the first attack or as recurrent attacks in individuals with a history of previous episodes. (6) Cyclothymic depressions are more frequently precipitated than manic attacks, and are far more apt to be precipitated as first attacks: the manic or mixed forms, on the other hand, occur in equal



numbers as first and later attacks. (7) The occurrence of manic-depressive psychosis is, on the whole, relatively infrequent. Of 175 cases in his series of psychoses associated with influenza, only 10 belong to this group. (8) Depression as a symptom in the other influenzal psychoses was relatively infrequent in the recent epidemics.

R. G. GORDON.

[88] **Tertiary syphilitic psychoses other than paresis.**—BURTON PETER THOM. *Amer. Jour. Insan.*, 1921, lxxvii, 503.

Few observers have investigated the important subject of the syphilitic factor in psychoses other than paresis. Alfred Gordon, of Philadelphia, has studied 23 cases for an extended period. One group consisted of 5 cases in which the psychoses developed in the secondary stage, and the other of 18 cases noted in the tertiary stage. In 3 of these trauma was recent, and the writer thinks this factor must not be disregarded. In the traumatic cases there were no hallucinations, but only a mild confusional state with some amnesia and slight delirium in the evening. In one case Korsakoff's syndrome was seen without any polyneuritis. The remaining cases of tertiary syphilitic psychoses were recorded as: 6 manic-depressives; 3 had paranoia; 2 showed involutional melancholia; 3 displayed progressive dementia. Manic-depressive insanity when due to syphilis is difficult to diagnose from paresis; but if the four reactions, the immobility of the pupils, and the loss of the patellar reflex are in evidence, paresis is present. If they are only partially present, the possibility of a syphilitic psychosis other than paresis may be considered. Lewis M. Gaines states he has seen idioey, imbecility, mania, melancholia, dementia præcox, and paranoia all caused by syphilis, and he suggests that a satisfactory classification can be made on the pathologic anatomy of the lesions. The psychic symptoms depend on the type of lesion and its anatomical site. When the base is attacked, stupor is apt to be prominent, though well-developed psychoses may dominate the picture. Syphilis of the convexity presents a different aspect. Some of the suggestive symptoms of cerebral syphilis in its various forms are given, and the differentiation from paresis is discussed. It is pointed out that infection may be a psychic trauma, and thus may hasten an incipient psychosis or cause the development of such in those predisposed. Although there is no psychosis pathognomonic of syphilis as far as the mental symptoms are concerned, there is no psychosis which cannot be caused by syphilis. Thom believes that a cure can be effected if early diagnosis is made and intensive treatment with salvarsan and mercurry at once undertaken; but the mental scars remain, and the patient is never as well mentally as he was before.

C. STANFORD READ.

[89] **Hallucinations in a case of schizophrenia.**—HENRY DEVINE. *Jour. of Ment. Sci.*, 1921, lxxvii, 172.

This is a most interesting and instructive study of the hallucinatory phenomena in a remarkably communicative and intelligent subject of schizophrenia. The hallucinations are auditory in character, and are believed by the patient to emanate from a set of personal entities which



he terms the 'Strengths' because of the controlling influence which they possess for him. The essential history of the case is to the effect that the patient fully realizes that he possessed certain tendencies of a cruelty or sadistic nature, against which, in the course of his life, he had had to exert a considerable degree of self-control; and, though he admits that on several occasions he had gone out of his way to give himself a partial gratification of these desires, he never gave way to conduct which was totally incompatible with the rest of his cultured ideals.

At the age of 35 he began to experience the hallucinations. According to him, the 'Strengths' are individuals of diabolical ingenuity and of great power and resource; they know all his past and throw it all up against him, particularly his thoughts, his suppressed but self-acknowledged unpleasant desires, and his little gratifications which he believed were known only to himself. They command him to perpetrate acts in accordance with his disorderly tendencies, they twit him with what he has done in the past, and they command him to do penance for his misdeeds or mis-thoughts by the performance of endless acts of expiation. They command practically his entire field of attention, and his will is powerless to withstand their influence.

Dr. Devine regards the case as being one of an isolated cruelty trend (or possibly one of an abnormal 'will-to-power' trend) in a personality built up upon a basis of highly-cultured ideals. The isolated trend had no outlet through the conscious personality, though it was, and still is, within the awareness of the personality. As Dr. Devine points out, there is the possible method of relieving the struggle by means of a phantasy development; but here the energy content of the trend was too intense to permit of peace with only a phantasy gratification, for the subject always realizes that the phantasy is unreal; consequently a true dissociation occurred, with the production of the authoritative auditory hallucinations. These, by reason of their complete objectivity, so far as the patient is concerned, came to dominate the personality entirely, and so achieved the complete gratification of the abhorrent desires.

THOMAS BEATON.

- [90] Contributions to the study of involuntional paranoia (Beiträge zur Kenntnis der Involutionssparanoia).—PAUL BOHNEN. *Allg. Zeits. f. Psychiat.*, 1921, lxxvi, 451.

INVOLUTIONAL paranoia was described by Kleist in 1912 as characterized by a distrustful state of mind with manie-depressive fluctuations, and by misinterpretations and memory falsifications in accordance with this affect. In addition, there existed a peculiar intellectual disturbance, a combination of thought retardation and fixation with flight of ideas. Some of his patients suffered from hallucinations, preponderantly auditory in nature. The delusions that were present were the resultants of all these processes.

The disease developed insidiously or advanced with acute outbreaks, each of which left the patient worse. It began during the period of sexual involution, affected those with a "hypoparanoid constitution" by exaggerating their morbid traits, and was much more frequent in women than in men.

He ascribed it to the metabolic displacement resulting from failure of the sexual internal secretions. It was not due to a destructive organic process, for he found defect phenomena (slight attention weakness) in only one-third of his cases, and in these the disease had already been present for periods varying from nine to twenty years. Two cases only had demonstrable arteriosclerosis producing symptoms. Kleist was inclined to consider the organic basis as one analogous to the physiological processes of growth and arrest of the brain which are constantly occurring throughout life. He emphasized the relationship of this involutional paranoia to the manic-depressive disease group, particularly to the depressed conditions of later life.

Dr. Bohnen describes here four cases which tallied exceedingly closely with the above definition; three were women, one a man. In all four of them delusions were present, linked to a conviction of injury and an exaggerated idea of their importance.

The last case developed rapidly, and his delusions were confined to the field of his personal rights, a querulant. Where erotic delusions were present, the loved one was also the persecutor. The delusions were in the main plausible, and related to persons in the patient's immediate environment. But stranger convictions could develop—as in one patient who felt herself in secret communication with her beloved, and interpreted every happening to her as a message from him. These patients showed no intellectual deficiency, and their personalities were fully developed, so that paranoïd defect psychoses and schizophrenia were out of the question.

Isolated incidents were first misinterpreted, and then later these were brought together, although contradictions could co-exist in this fusion, which varied in degree. If the delusional formations were stripped of their externals of circumstance, the affect of mistrust was seen to be present in all, associated with irritability, sensitiveness, scorn, or sense of rights in the several cases. These delusions were accompanied by strong feeling; incidents were distorted and related to the patient's self. Physical disturbances due to illness or incidental to the period of life were sometimes starting-points of delusions, but played only a minor part. Memory disturbances occurred, but rarely free fabrication. Two of the cases had auditory hallucinations. Intellectually there was found excessive productivity in relation to the delusions; elsewhere retardation of ideas. Delusions tended to repeat themselves in stereotyped manner, and to break in upon associations to other topics.

Arteriosclerosis was hardly perceptible in three of the cases; but the last one had remains of a slight hemiplegia, which had come on seven years after the beginning of his mental trouble. Near relatives of two of the other three cases had died of apoplexy. The three women became ill at the climacterium, and the disease reached its height about ten years later. One of the women had been sexually prudish; the man was querulant before his breakdown; in both of them these traits were exaggerated by the disease. Some relatives of these patients showed evidence of manic-depressive disturbances, and involutional paranoia is probably related to this psychosis.

H. W. HILLS.

## PSYCHOPATHOLOGY.

- [91] Reaction to personal names.—C. P. OBERNDORF. *Internat. Jour. of Psycho-analysis*, 1920, iii, 223.

THE author gives illustrative cases supporting his contention that "unpleasant emotional reactions to personal names may result from an unconscious feeling on the part of the individual bearing that name; that it in some way revealed an inherent weakness in personality which the individual wished to conceal". Where a new name is adopted, an unconscious outlet is secured for the wish to rectify these deficiencies which the individual had in some way come to identify with his name. The new name chosen, where the unconscious motive is not identical with the conscious, is apt to reflect a compromise reaction, so that it rarely differs completely from the former one.

C. W. FORSYTH.

- [92] The reversal of the libido-sign in delusions of persecution.—AUG. STÄRCKE. *Internat. Jour. of Psycho-analysis*, 1920, iii, 231.

IN delusions of persecution the figure of the loved one, more or less disguised, reappears as the persecutor. Freud terms this the return of the repressed libido with the reversal of the sign: that is to say, what was repressed in the shape of love returns as hatred. This hatred is projected, and represents the content of the delusion. An attitude of ambivalency is essential before this reversal can take place. The writer has found in his patients that the content of the persecutory delusion is frequently anal persecution. The core of the delusion which is kept so secret is as a rule concerned with anal acts of lust and violence. The results of investigation make it probable that an unconscious identification of the loved object with the skybalum (faeces) was present in the first instance, and that this identification provides the basis for the special ambivalency of the paranoid constitution. The skybalum is the primary (real) persecutor; it commits anal acts of violence which are often at the same time acts of pleasure. It is responsible for one of the most primitive attitudes of ambivalency, for in regard to it pain and pleasure often make their appearance in rapid succession. This primary ambivalency is later strengthened (secondary ambivalency) by the people in charge of the child in connection with the process of cleaning, since punishment for dirtiness and praise for orderliness in evacuation result automatically in hatred or love as the case may be. The later effects in memory of the events connected with defaecation in earliest childhood result in a predisposition to a subsequent identification with the skybalum of (1) the child's own body and (2) the person in charge of it.

Freud holds that delusions of grandeur are the regression of sublimated homosexuality to narcissism. The writer would add that this narcissism should have an anal-erotic origin. Delusions of persecution are as often accompanied by delusions of inferiority as by delusions of grandeur, and even by mixtures of the two; this would be explicable by the inherent ambivalency of anal-erotic narcissism.

C. W. FORSYTH.

- [93] On the origin of the feeling of persecution.—J. H. W. VAN OPHINJSEN. *Internat. Jour. of Psycho-analysis*, 1920, iii, 235.

THE author includes in the feeling of being persecuted the neurotic's ideas of reference, his common fear of being attacked from behind, and the uncanny feeling of which the paranoic also complains. He finds that it can be traced back to the anal complex. Analysis of dreams of three patients are given. In the first case the analysis suggested that the persecution may be an assault from behind (directed at the anus) on the part of a person (the father) with homosexual intentions; in the second case the persecutor and skybalum are simply treated as equivalent things; in the third patient the morbidly anxious interest in the w.c. (in his dream) was a further development of the patient's interest in his own waste-tube and in what might come out of it.

C. W. FORSYTH.

- [94] The psychology and treatment of insomnia in fatigue and allied states.—JOHN T. MACCUBBY. *Jour. Abnorm. Psychol.*, 1920, xv, 45.

THE writer sees in insomnia the establishment of a vicious circle. After a sleepless night, an undue strain is involved in maintaining awareness. Absorption in the task becomes obsessive, and the accompanying mental excitability to external stimuli constitutes the beginning of restlessness. The degree of these counter-tendencies is the measure of the unconscious desire for sleep. Unconsciously lazy, the patient becomes pathologically active. This pathological activity is maintained when the patient goes to bed, and shows itself in a condition of muscular tension which, owing to its reminding him of strychnine poisoning, the author considers may be due to fatigue toxins, and a general attitude of attention. As has been said above, the absorption in the task is the measure of its unendurability. As the unconscious becomes more exacting in its demands for sleep, any activity becomes abhorrent, and the wish to escape all demands is formulated in a yearning for the nirvana of death. This often finds conscious expression in fear of accidents, or questions as to the value of life. Death is, of course, a great and final lapse of consciousness. Hence any lack of mental activity, suggesting the greater loss, must be compensated for by greater conscious activity—the patient seeks to maintain contact with his environment by an apparently purposeless restlessness. He is in a state where anything suggestive or symbolic of death repels and at the same time fascinates him. The author conceives that a struggle now ensues between the instinct for life and the desire for sleep, with its symbolic significance of death. The circle is complete in its viciousness.

Two cases of insomnia are cited in which treatment consisted in explanations on these lines, with completely satisfactory results.

JAMES YOUNG.

- [95] The compensatory mechanism of delusions and hallucinations.—S. A. SILK. *Amer. Jour. Insan.*, 1921, lxxvii, 523.

THE biologic strivings as seen in animal evolution are discussed, and it is shown how in man the psyche becomes the chief control of all human



activities, and enables him to adapt himself the more efficiently to his complex environment. Social adaptation brings psychic conflict in its train, and the 'will to power' becomes a motivating force. Mental flight from reality as seen in day dreams, phantasies, etc., is not a good method of overcoming difficulties, and must be considered pathological at the social level. Just as bodily defence mechanisms if continued for too long a period may cause individual exhaustion and death, so at the psychical level delusions and hallucinations are defence mechanisms and may lead to a similar end. Man is a reacting unit, a transmuter and transmitter of energy, and all his activities aim at the better adjustment to environment to satisfy his biologic demands. As a social unit he meets obstacles in his attempt to satisfy his libido, and the overcoming of such may be attempted by fight, by changing social custom or repressing his desires, or by flight through psychical substitution, so that the individual perceives the environment in a way compatible with his wishes or conceives himself the possessor of desires approved by society. Cases to illustrate the compensatory mechanisms of delusions and hallucinations through which biologically inefficient individuals aim to adjust themselves as social units are given and discussed. It is pointed out that just as fever is no symptom of any definite disease, so a certain delusion or hallucination is no indication of a definite mental conflict; and just as certain groups of symptoms often indicate a specific disease, so a certain group of delusions and hallucinations frequently point to a definite mental conflict. Delusions of persecution and reference coupled with ideas of great efficiency, power of invention, and a history of heterosexual abstinence, in a majority of cases indicate homosexuality and impotence.

C. STANFORD READ.

[96] **A case of war shock resulting from sex-inversion.**—C. W. S. DAVIES-JONES. —*Internat. Jour. of Psycho-analysis*, 1920, iii, 240.

This patient complained of 'something' lurking in the dark, especially in his bedroom. During the Somme battle he had frequently to pass the unburied head of a soldier; one night he accidentally trod on it, and was instantly filled with great revulsion of feeling. This incident was associated in the unconscious with a repressed sexual trauma which occurred when the patient was 16, and which was the cause of the homosexual regression. The analysis effected a cure of his 'war shock' symptoms, but the writer found that the sexual inversion was so complete that heterosexuality was a closed channel.

C. W. FORSYTH.

[97] **Miss Beauchamp. The theory of the psychogenesis of multiple personality.**—MORTON PRINCE. *Jour. Abnorm. Psychol.*, 1920, xv, 2 & 3, 67.

This is a further exposition, covering seventy pages, of Dr. Prince's well-known case of multiple personality. It is impossible to give an account of it here, but the writer's conclusion is interesting. He says: "This interpretation or theory of dissociated personalities is opposed to present-day attempts of a monistic psychology to refer the phenomena of the psychoses to a single subconscious motive, a wish, whether sexual or one



to 'escape from reality' (so-called defence reaction) or some other, and which would only use organized complexes of innate and acquired dispositions to effect a philosophic purpose. . . . In the alliance of the psychological dispositions, the conception of a primitive unconscious sexual or other desire. . . . like Descartes' soul in the pineal gland, pulling the wires and directing the dynamic forces of organized systems constituting personality, both 'shocks the imagination' and is to my mind untenable. The present-day tendency to find a quasi-philosophical single principle to explain the complex psychological phenomena of personality, a sort of psychological monism, is not only fallacious, but is bound to remove psychology from the field of science. Psychology deals with concrete phenomena which are the resultants of a complexity of forces driving in different directions. The law of the final drive is more comparable to the physical law of the 'resultant of forces'."

JAMES YOUNG.

- [98] Four cases of regression in soldiers.—W. McDougall. *Jour. Abnorm. Psychol.*, 1920, xv, 136.

THE writer gives a detailed account of four cases of regression. He is careful to state that he uses the word regression in a descriptive sense only, and dissociates himself entirely from the Freudian use of the term. He compares the more lately developed parts of the cerebral cortex (which apparently are co-extensive with the more lately developed psychological functions) with the growing points of the upper branches of a tree. If the latter are injured, new buds appear in the lower, older parts of the tree. The sap (libido) regresses and reanimates a zone of earlier development. Similarly, under the influence of fear the human being regresses to a level in which older, more primitive infantile levels of functioning are reanimated. The writer sees no reason to postulate as the root of these regressions any hypothetical incestuous fixation on the mother or any unconscious desire to return to the womb. Moreover, even if it were possible that a 'mother complex' played a part in determining regression, it would still remain a question whether such a complex contained any sexual component.

JAMES YOUNG.

- [99] Malingering and simulation in warfare.—TOM A. WILLIAMS. *Amer. Jour. Insan.*, 1921, lxxvii, 567.

WITH regard to this subject two contrasting opinions stand forth conspicuously. One is that every symptom for which no grave physical sign can be found is due to simulation, and that every soldier should be suspected of malingering unless he can prove to the contrary. The other is that every simulator is proved by that very fact to be abnormal mentally, and he should be interned rather than punished. Really malingering is a normal reaction of simple-minded persons, and is almost universal in young children, given circumstances which permit it. It is not a mark of disease, unless we so call the human desire for comfort, sympathy, and protection from danger. The argument of irresponsibility is quite refuted by the salutary effect of the fear of punishment. A class of simulators who are

pathological are the mythomaniacs or pathological liars. They are akin to the dipsomaniac in that they are not deterred by the knowledge of inevitable serious consequences. The genesis may often be found in the environmental conditions of childhood, and their character is only an exaggeration of tendencies present in everyone. In warfare the motive is commonly one of self-preservation, and a certain æsthetic pleasure is often obtained from such conduct. Normal mythomania appears to have a motive, and is proportioned to it, whereas abnormal mythomania seems insufficiently motivated or not motivated at all, its duration is persistent, and its intensity is out of proportion to its cause.

Three kinds of mythomania are to be differentiated—vain, malicious, and perverse—and the three may be combined. One must remember that there is often a groundwork of fact, but by auto-suggestion the psychopath believes everything he has invented. Mythopathic activity is often unconscious and involuntary, but often works with the help of will, especially at the beginning of fabrication. Simulators of deaf-mutism are then discussed, and here two groups are recognized: the *creative simulators*, who seek to realize imaginative attitudes, movements, or sensory difficulties calculated to awaken pity: and the *fixative simulators*, who, having really suffered from a nervous lesion and perceiving a betterment, exploit and perpetuate their symptoms. Every subject who, without any verifiable disorder of the nervous centres or of the organs of hearing and speech, and without a characteristic psychosis, remains completely deaf and dumb for three or four months, may almost certainly be considered a malingerer. Out of 17 cases of complete deaf-mutism attended during three months, 9 confessed their simulation. In 6 cases the fraud was discovered by appealing to their patriotism and conscience, and also giving them some physical treatment which serves as a pretext for their rapid cure. The fixative simulators may remain obstinate. Intensive faradization and the threat of court martial only remain. In conclusion, the questions of the management of malingerers, their legal and moral responsibility, the detection of simulated pain and weakness, and the problem of prevention are all touched upon.

C. STANFORD READ.

## TREATMENT.

[100] Reduction of nervous irritability and excitement by progressive relaxation.—EDMUND JACOBSON. *Jour. Nerv. and Ment. Dis.*, 1921, liii, 282.

THE author complains of the neglect of the physiology of 'nervousness' in its treatment. Even in the Weir-Mitchell régime, when relaxation of mind and body is aimed at, little stress is laid on this, in the written accounts of it. The neurotic has lost the habit of relaxation, but it is not enough to tell him to relax his muscles: indeed, a patient may be apparently relaxed in bed for days, and still be worried and show this in his facial expression and the hypertonicity of his muscles. Complete relaxation is necessary for repose and sleep, but most people are unaware when they

are completely relaxed. The author states that insomnia is always accompanied by a sense of residual tension which can be recognized both subjectively and objectively by the trained observer. The patient is taught progressively to relax his various muscle groups, and through practice he augments the relaxation until eventually he gets rid even of the residual tension. All effort, including the effort to relax, must be avoided, and the patient comes to recognize the existence of local tension and to relax it. The author is anxious to distinguish his method of treatment by progressive relaxation from suggestion and other forms of psychotherapy, and admits that it is not universally successful. He quotes five cases which had been treated with more or less success. While this method would appear to be useful in conjunction with other forms of psychotherapy, it would seem that the author, in common with many other upholders of the James-Lange theory, lays too much stress on the inevitable mental improvement which is said to follow adjustments of bodily reactions. More efficient treatment will probably result when it is more fully recognized that mental and bodily symptoms are both the concomitants of the biological reaction of the individual to something in his environment, and that either this total reaction or the environment must be changed before the patient can be restored to health.

R. G. GORDON.

[101] Some considerations in psychotherapy. W. H. BRYCE. *Jour. of Ment. Sci.*, 1921, lxvii, 195.

THE author points out the difficulty in the position of psychotherapy at the present time arising out of the total lack of co-ordination of the various schools of thought. He instances that Sidis has it that all is 'fear': Freud that everything is 'sex': Adler that the ultimate factor is the 'feeling of inferiority'; while each wants everything analyzed back to his own particular basis. Again, in regard to the conception of the unconscious in the human mind, one school considers it to be composed mainly of material thrown back or rejected by the personality: another that it is present at birth and contains all the primordial thought-feelings; while a third regards it as the receptacle for lost memories and of phenomena as yet too feeble to become conscious.

Dr. Bryce thinks there is truth in all these views. He has met with cases that conform to the one school, and others that belong to the other schools of thought; but he insists that we cannot now do without the mechanisms which we owe mainly to Freud, and we must not let the confusion and the prejudices which are rampant prevent us from applying them in practical work.

He proceeds to deal with the possibilities arising out of the necessity for coping with a situation of conflict, and then takes up the question of 'worry'. Worry he regards as the simplest form in which we see the expression of non-adaptation to the immediate circumstances or requirements: here the subject is up against some proposition or situation with which he cannot deal efficiently: he has failed to adapt to the particular

circumstances, be they outside or inside himself, and instead of efficient thought-action there is a vain repetition of the situation, leading to the single idea which is the fact of the situation. This paralysis of efficient thought is due usually to a desire to avoid some unpleasantness that will arise if the thought is permitted and the matter is sifted and dealt with properly. Should these resistances to thought connected with the situation be effective, the situation, naturally, would be dismissed from the mind: but when they are not effective the subject can neither get away from the situation nor deal with it, and it is then that the state of worry arises.

The author considers that neurotic symptoms occur not only from the total repression of a complex, but sometimes from merely a lack of recognition between cause and effect: in such cases there is no need to invoke the unconscious for establishing a recovery. Similarly, in many cases where the symptoms are in reality purely the manifestations of a persistent emotional state, the fault, or rather the anxiety of the subject, rests on the lack of conscious association between cause and effect.

He concludes with the exhortation to approach each case broadly-mindedly; if necessary, to bring more than one of the view-points to bear on any one case, for though no one line of thought is applicable to all cases, yet every line is useful in some.

THOMAS BEATON.

[102] Familial care of the insane.—C. STANFORD READ. *Jour. of Ment. Sci.* 1921, lxxvii, 186.

THIS paper is concerned with the conditions applying at the colony at Gheel, Belgium, where, for some hundreds of years past, the insane have been treated by being boarded out in households surrounding a central institution. Arising apparently out of a religious foundation, the tradition has been established amongst the peasants living in the area of countryside involved, of receiving in their homes such patients as are selected by the medical director of the central institution, and every effort is made to find the exact home which is most suited to the patient's requirements. When visiting the colony recently, Dr. Read found that, with the elimination of all cases with definite anti-social tendencies by a preliminary period of observation in the central institution, all forms of mental alienation can be treated in this way, and that even cases which, in their own home milieu, had exhibited dangerous tendencies, became quite tractable and manageable under the conditions of the colony.

The success of the scheme obviously depends upon the well-established traditions of the countryside, and grave misgivings would arise were such an arrangement to be prospected in, say, this country: but Dr. Read feels that the complacency with which institutional confinement is regarded as the first principle of treatment for mental disorder, in this country, is a result of convention, and that it merits considerable criticism in view of the practical results of the methods applied at Gheel.

THOMAS BEATON.



- [103] An analysis of more than 200 cases of epilepsy treated with luminal.—C. C. KIRK. *Amer. Jour. Insan.*, 1921, lxxvii, 559.

THE purpose of this paper is to make a preliminary report on the effects of luminal on the severe types of epilepsy as seen in institutions. The author thinks that this gives promise of being the most effective and the least harmful of all drugs that have been used in the treatment of this disease. After dwelling on the importance of diet, bowel elimination, and the objections to treatment by bromides, the action and uses of luminal are spoken of. The cases selected were those whose seizures were the most frequent and severe. No change in diet was made, but the quantity of food eaten was supervised, and all stimulants, tea, coffee, and tobacco were prohibited. The results in certain cases were so startling that very shortly all cases of idiopathic epilepsy were placed under this treatment. The method consisted of giving  $1\frac{1}{2}$  gr. of luminal at bedtime, and the dosage was not increased except in five instances. There was immediate decrease in the number of seizures, a decrease in the severity of the seizures—many of them changing from grand mal to petit mal—decrease in the severity of fire, and a shortening of the time of confused states. There was seen as well an improvement of the mental and physical health, a fewer number of accidents, a general improvement of the moral tone of the wards, and a complete cessation of the seizures in a large number of cases. No deleterious effects were observed, there was no sign of the drug being habit-producing, and in certain cases it seemed to be effective in twenty-four to forty-eight hours. A few very brief case reports are given in illustration.

C. STANFORD READ.

- [104] The group treatment of dementia præcox.—EDWARD W. LAZELL. *Psycho-analytic Rev.*, 1921, viii, 168.

BECAUSE of the inaccessibility of these cases and the time taken up by individual treatment, the group method was instituted by the writer at Saint Elizabeth's Hospital, Washington. There are certain groups of facts which may be given to such patients in lecture form, such as the Oedipus problem and the problems of sexual development. They should be not merely assisted to a social adjustment, but more fundamentally re-educated by directing their instinctive demands into normal channels, not only compatible with the ego-ideal, but also with the herd law. It was at once found that only such patients as presented the same fundamental problems, and were solving their difficulties in the same manner, should be included in the same group. It was seen that the patient who recovers with insight, and really conquers himself, passes through the stages of development the libido should originally have passed through. The first grouping of patients was made according to the prominent symptoms presented, and it was found that all cases of dementia præcox can be placed in one or the other of two great groups—the aggressive and submissive homo-erotic, conforming in a general way to the terms hebephrenic and paranoid. The family situation between the parents in infancy was found to be of great importance in determining the type the patient would develop. Both types wish the



love of the mother, but the hebephrenic takes the aggressive or masculine rôle, while in the paranoid the wish is submissive and feminine. This is of the greatest importance in the treatment.

The advantages of the group method are stated to be : (1) The patient is socialized with reference to the fear of death and the sexual problem ; (2) The fear of the analyst is removed ; (3) Even those apparently quite inaccessible, heard and retained much of the material ; (4) Many develop a positive transfer ; (5) The patients discuss the lectures with each other, thereby adding to the force of the talks. *The patient is regarded as accessible at all times to the correct manner of approach*, and the term 'inaccessible' is only a projection of our inability to understand the symptoms. Jung's view has been adopted that the real difficulty is a bar to the onward flow of the libido, and that this obstruction must be removed. The praecox is homosexual only because he cannot become heterosexual. Many patients make an adjustment so that they live in asylums in peace. During treatment many are made temporarily worse, but these episodes are constructive, and they emerge from the conflict on a higher level. The material presented to them corresponds more or less with the problems faced by the child as he progresses in development, the talks being consecutively as follows : The fear of death ; the conflict thus produced ; the reactivation of infantile emotions and wish-fulfilments ; explanation of the most common hallucinations such as concerning fellatio, S.O.B., German spy ; masturbation ; self-love ; homosexuality ; inferiority and its causes ; usual causes of flight from women ; over-compensation for inferiority ; explanation of hallucinations and delusions ; day dreaming. In conclusion, Lazell advocates an extension of this method to defectives and young criminals, and he feels that in the hands of competent psychotherapists of the psycho-analytic type the group method of treatment will prove a great advance on the methods now in use.

C. STANFORD READ.

## Reviews.

A Young Girl's Diary. Translated from the German by EDEN and CEDAR PAUL. Cr. 8vo. Pp. 271. 1921. London: George Allen & Unwin. 12s. 6d. net.

Of the making of books about children there is no end, and if by now we do not know everything that is to be known about them, the fault does not lie with the authors who so indefatigably look to our wants. And yet all this plenty and to spare somehow leaves us unsatisfied, replete and yet hungry as after meat but no bread. Take any other class of humanity—deep-sea fishermen, Buddhists, chiefs-of-staff—are we content to read only what others write about them without wanting their own account of themselves? Always it is first-hand experience that we value most, and when the other day a deep-sea fisherman for the first time in history wrote a book about his class, was not his work read eagerly by thousands, and did not an astonished and grateful country forthwith elevate him to be Chief Deep-sea Fisherman in Whitehall?

But with the children how great is this difficulty. The very immaturity which is their characteristic, and which we want to understand from their inside point of view, excludes them from enlightening us. *Ex hypothesi*, as it were, they are doomed to silence, fated to be sentenced unheard by any self-appointed judge, whose first claim to office, be it noted, must always be that time has made him a stranger and an alien in the happy fields of childhood.

But suppose the difficulty removed—it is, of course, manifestly impossible; but let that pass—suppose the publication of an autobiography of a two-year-old, and picture the electrical effect in the psychological schools which are at present contending even as to the fundamentals of child-psychology. The confessions of but one suckling would still the disputants for ever, and nine-tenths of their fine theories would crumble to dust.

Mercifully, perhaps, this disaster is never likely to overtake them. At the worst some older child, apter with ink and pen than most of its age, might set down a true record of its life; but few such records would be free from the sophistication and convention which almost inevitably hamper the adult writer who undertakes the literary expression of his *vie intime*.

English literature possesses one and only one such child-record—Pet Marjorie's, the little friend of Sir Walter Scott—and no more dismal proof could be found of how quickly and completely a child's mind can be

swamped and suffocated by its elders and betters. Marjorie, it will be recalled, lived but seven years; this short life she spent in the orthodox atmosphere of middle-class Edinburgh of a hundred years ago; and she left behind some literary remains which were edited by the author of *Rab and his Friends*. "As this is Sunday," writes this mite, "I will meditate upon sensible and religious subjects. First I should be very thankful I am not a beggar." On another occasion her own choice of a piece for recitation lay between "Few are thy days and full of woe", and "Why am I loth to leave this earthly scene?"

Sentiments of this kind issuing from a child were very precious to our great-grandparents, who did not stop to consider that what came forth was only what had been poured in. But nowadays we neither value our children as parrots, nor try to crush their spontaneity by neglect if not worse.

Or at least we are tending that way, and must have made some progress in the century since Marjorie died, else *A Young Girl's Diary* could never have been written, still less published. Here is a child who began keeping a diary when she was 11, and carried it on till she was over 14, and even if she had achieved nothing more than the transparent honesty and truthfulness of her entries the result would have been remarkable. But she reveals much more than this. She is a child whose naturally keen observation has been blunted not at all by any clumsy handling by grown-ups; and though the round of her life included nothing but her home, her school, and her holidays, she seemed to find in everybody and everything scope for her alert senses and warm sympathies. Especially was this the case within her own family circle and among her classroom friends. Not that for a moment did she consciously lay herself out to study them, not once does she show that she is aware that she is studying them, but always her account is of how she was affected by the happenings around her, what she thought and felt about them, surmised and discovered.

In this way we see everything through her glasses, and some delightful (as well as some objectionable) characters we have to recognize. Most charming of all, however, is the little girl herself with her loving and lovable ways, her enthusiasms and antipathies, her frankness and deceptions, and her insatiable thirst for knowing and getting to know.

Everyone who is familiar with children as they are, or who cherishes any affectionate interest in them, will hasten to give himself the pleasure and instruction of reading this book.

The diary comes from the publishers with a prefatory letter from Professor Freud, who speaks of it as a gem. Even apart from his recommendation, it contains hardly a page without some entry of special interest to students of Freudian literature. For this very young lady was not only busily occupied with falling in and out of love with people of either sex, but she presents a convincing picture of her own Oedipus-complex, and shows herself struggling to achieve emancipation from her parental ties. And more than this. In the honesty of her mind she reveals with all simplicity her consuming curiosity in sexual matters, and the disappointments and successes which met her efforts to gain forbidden knowledge.

Here, too, it is impossible to doubt her sincerity, with the result that unwittingly she has made a significant contribution to psycho-analytical literature. Pet Marjorie's parents would have been shocked by this twentieth-century young girl; but of the two children, who can hesitate between them?

D. F.

**The Form and Functions of the Central Nervous System: an Introduction to the Study of Nervous Diseases.** By TILNEY and RILEY.

The Review of this volume which appeared in our May issue was from a copy sent us direct from the American publishing house in New York, before concluding an arrangement with Messrs. H. K. Lewis and Co. Ltd., Gower Street, London, by which the English distribution is left in their hands. The price in England is £3 10s. net. Our readers will be glad to learn this.

# THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

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## Original Papers.

### THE RELATION OF PSYCHONEUROSES TO MENTAL DEFICIENCY.\*

By E. PRIDEAUX. CAMBRIDGE.

DURING the War we heard very little of mental deficiency in this country. Cases of every kind—all failures of adaptation brought on by emotional or commotional shock, actual neuroses, psychoses, and mentally defectives lacking in the innate potentialities for adaptability—were more conveniently bundled into the new pigeon-hole ‘shell shock’, and these have been handed down to us as pensioners under the official term ‘neurasthenia’. Little account seems to have been taken of mental deficiency as such, and high-grade amentia has been rarely recognized. In the stream of war literature that has come forth devoted to the question of the psychoneuroses, this aspect of the subject has been completely neglected. Only such cases as were severe enough to come under the observation of the psychiatrists have been recorded. And yet, as an indication of the general ignorance relating to the diagnosis and recognition of mental deficiency in this country, which resulted in so many defectives being passed into the army, the reports of various medical officers<sup>1</sup> show that the admissions for such cases to military mental hospitals varied from 14 per cent to 30 per cent of total cases, and that, as we should expect, mental deficiency always figured more prominently in the

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\* Excerpt from lecture delivered at the University of London for the postgraduate course in Mental Deficiency on June 2, 1921.



admission of those who had not been overseas. Whereas, in the American army, on the other hand, "21,000 men were rejected on account of nervous and mental disorders, of which number practically one-third were feeble-minded".<sup>2</sup>

The views held as to the relation between mental deficiency and the psychoneuroses are never explicitly stated. Some psychopathologists, who are confined to the study of the psychoneuroses and have never had to deal specifically with defectives, certainly seem to forget, and would almost seem to deny, the very existence of innate mental defect, or at any rate are of the opinion that much of what is thus labelled is in reality an acquired condition as the result of some inhibition, an emotional blocking of mental processes. On the other hand, one writer, Professor H. L. Hollingworth,<sup>3</sup> has recently put forward the view that the psychoneuroses are intimately related to intellectual deficiencies, in that the ignorance of mental reactions responsible for symptom formation is due to want of sagacity, and not to the assumption, which is now so generally accepted, that such reactions take place outside consciousness. Hollingworth uses the term 'sagacity' in the sense ascribed to it by James,<sup>4</sup> as the "perception of essence", "the ability to comprehend properly the part in its relation to the whole, and to discriminate out of a whole the appropriate, relevant, or significant detail". The special mechanism of the psychoneuroses, according to this author, is due to this failure in sagacity, with a consequent "disposition to react to a present total situation by singling out some detail of it, and reacting to this detail by some total reaction previously associated with a whole in which the detail figured as an item". This process he calls 'redintegration', a term which was originally used by Sir William Hamilton in his *Law of Repetition* to indicate the tendency of a complex idea to be reinstated upon the occurrence of one of its constituent parts, a very old psychological law, which has now received in part its confirmation in physiology by the work of Pavlov on conditioned reflexes.

Anyone who is in practice dealing with both classes of cases—psychoneurotics and mentally defectives—recognizes at once that neither of these extreme views actually meets the case. The first view does not take into consideration the actual pathological facts—the numerical deficiency and imperfect development of the cerebral neurones—which have been demonstrated and established beyond all doubt in cases of mental deficiency; it only emphasizes the possible effects of a psychoneurosis. The second view, though it appears to be correct as far as it goes from the descriptive point of view, does not take account either of the fact that accompanying the intellectual deficiency there is some temperamental instability which would seem to be the more likely factor at the basis of the

psychoneurosis, or of the fact that a psychoneurosis may and often does occur in those who have exceptional intellectual abilities. Moreover, the development of sagacity, as James himself recognized, is dependent on affective factors, on practical and æsthetic interests—"the dog singles out of any situation its smells, and the horse its sounds, because they may reveal facts of practical moment, and are instinctively exciting to these several creatures".

It would seem, however, that some of the relations between the psychoneuroses and mental deficiency are obvious enough to be definitely stated.

1. The psychoneuroses, in common with some of the psychoses, dementia præcox and manic-depressive insanity, may be superimposed upon an existing amentia, especially amentia of a high-grade type. Of the psychoneuroses this more often occurs with conversion hysteria, which, I think, occurs much more frequently amongst high grade aments than is usually recognized. And it has always seemed to me that the old "Yes-no test" (say 'Yes' when you feel the pin, and 'No' when you don't) is of more value as a criterion of feeble-mindedness than of hysteria. The anxiety states and obsessional cases are uncommon amongst defectives and the psychosis\*paranoia must be almost an impossibility amongst them.

The intellectual status of a psychoneurotic patient, when his condition is fully established, is difficult to estimate, for mental tests in my experience are then of doubtful value; but the standard reached at school does give us a rough guide, though we know that it is not always reliable on account of the tendency to put children up into higher standards on account of their size and age. Unfortunately in this country no records were made as to the intellectual status of the men on enlistment, and we have no criterion by which we can judge whether the war psychoneurotics as a whole differed from the general average in this respect. But, as was first pointed out by Myers and later emphasized by Rivers,<sup>5</sup> everyone is agreed that conversion hysteria is especially apt to affect the private soldier rather than the officer. As Rivers states, "pure cases of this kind are rare among officers, who, as a rule, only suffer from this form of disorder as complications of states of anxiety, or when there is some definite physical injury to act as a continuous source of suggestion". And the only observation I can find that has been made by observers in this country as to the intellectual status of conversion hysteria patients is that made by Adrian and Yealland to the effect that "the majority of patients are below the average normal intelligence as judged by the Binet-Simon scale, and others who are more highly equipped prove to have an unstable history either personally or in the family".<sup>6</sup>

My experience amongst officers is small, but it has been confined entirely to anxiety and obsessional states. It was not until six months before the end of the War that I realized the importance of recording the standards reached at school in all cases, and at that time the number of conversion cases that came into my hands was much smaller than in the earlier stages of the War. An analysis of my cases of definite war neuroses treated since then, excluding epilepsy—324 cases amongst non-commissioned officers and men (my obsessional cases were amongst officers and were merely aggravated by the War)—shows very clearly the liability for those in the lower standards to suffer especially from conversion hysteria and for those who had reached the higher standards to suffer from anxiety states. [See the accompanying scheme.] For example, amongst my military in-patients, of those who had not reached higher than Standard III 82 per cent suffered from conversion hysteria, whilst of those who had reached Standard VII only 6 per cent suffered from conversion hysteria, and many of these were of the fixation hysteria type. This classification was made according as the symptoms were most marked for that particular class, so that some of the anxiety cases suffered also from slight conversion symptoms, and some of the conversion cases showed additional symptoms of anxiety. My figures also show another point of practical importance, which is that the pensioners who have had treatment of various kinds over a long period and are still going the round of special hospitals and clinics, are as a whole of a lower grade of intelligence than my military patients. Whereas over 50 per cent of my military patients reached Standard VII, only 24 per cent of my present pensioner out-patients did so. This may, in part, be due to the fact that I am now treating patients from rural districts: but the same tendency was apparent amongst my in-patient pensioners, who came from the precincts of London. I conclude from this that the higher grades tend towards a more complete recovery as the result of treatment. Those in the lower grades can never be made capable of adapting themselves to a difficult environment, however much treatment they may have, for they have not and never have had the necessary potentialities for adaptability—their environment must be adapted to them.

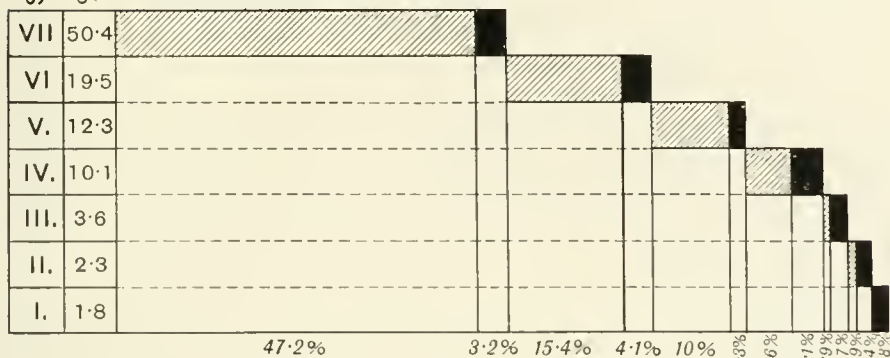
2. In the family histories of the feeble-minded in Cambridgeshire, in whom there is evidence of a neuropathic inheritance in 90 per cent, it is common to find that one of the members has had 'shell shock'. In the majority of my psychoneurosis family histories there is no record of grave mental disorder or defect, though, of course, it may be that in some cases it was concealed; amongst those in whom such a history was present the prognosis has in consequence been much more grave.

## CLASSIFICATION OF WAR PSYCHONEUROSES

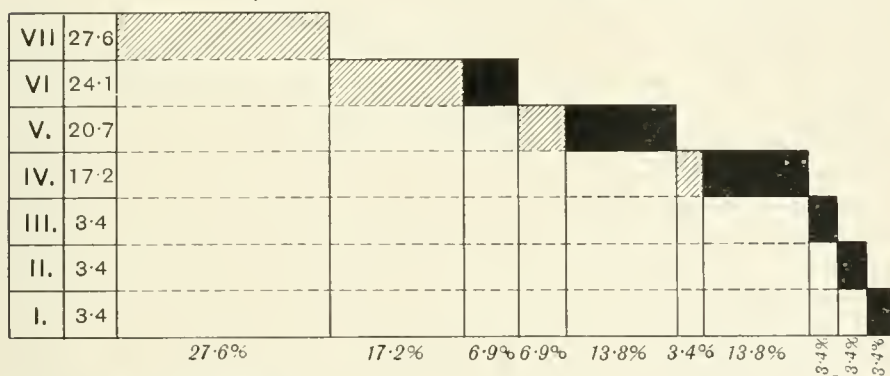
according to School Standard. 324 Cases.

Standard  
% in each

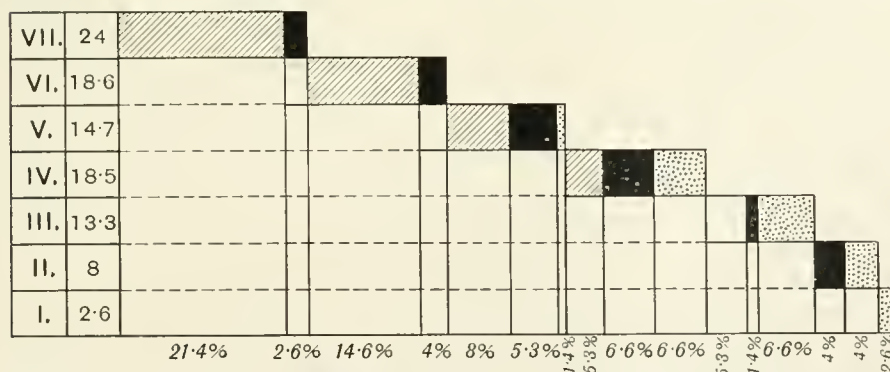
Inpatients. Military Hospital. July 1918—Oct. 1919.



Inpatients. Pensioners. June — Sept. 1919



Outpatients. Pensioners. Jan.1st.—Dec.31st. 1920.



Anxiety States



Conversion Hysteria



Constitutional Inferiority



3. Many of the symptoms, both physical and mental, including delinquency, pathological lying, etc., are common to both conditions and require differential diagnosis. Thus, speech defects of all kinds are common in mental deficiency, but the only one which may give rise to difficulty is stammering. Stammering which developed at the age of learning to speak is generally of the mentally defective type, is persistent, and is often associated with left-handedness, but it is more amenable to treatment by speech training. In the psychoneurotic type it develops after a period of normal speaking, it disappears in the presence of inferiors, it is much more common in males than females, it is more marked as the result of emotion and may be exaggerated over certain words, and it requires psychological treatment. But it is important to remember that stammering of this type may be a cause of mental retardation and lead to the suspicion of feeble-mindedness.

Enuresis is another symptom which may give rise to difficulty after organic causes have been excluded; in most cases a diagnosis must be made between mental deficiency, in which case control of micturition has never been established, a psychoneurosis, and a minor form of epilepsy, and this can only be done by the consideration of the history and by the presence or absence of the other signs of these conditions. The same applies to the so-called habit spasms, head-shaking, nail-biting, etc., which are so common in both psychoneurotics and mentally defectives.

The most important of the mental symptoms common to both are those related to the affective life, though a psychoneurosis in early childhood may be the cause of considerable retardation, and is often responsible for intellectual disturbances, such as loss of memory, weakness of concentration, and defects of judgement and apperception. The child may then become incapable of sustained attention, and may be unable to adapt himself to new conditions or acquire new ideas. The history will furnish the diagnosis, and such conditions can generally be shown to be due to preoccupations; moreover, the extreme variability, the ups and downs in the behaviour, give us the clue. Janet says of hystericals, "From the beginning of the disease they cease to develop. Instruction is entirely arrested whatever be the age of the subject".<sup>7</sup> He quotes the case of a girl, who had been an excellent pupil in her school; she developed hysteria at the age of eleven, from which time she ceased to learn anything. It is this kind of arrest, according to Janet, which is responsible for the production of that infantile state of mind so generally observed in the conduct of all hystericals. Such an extreme case as that quoted by Janet does not appear to be common, and has probably a definite causation in a study of the emotional factors concerned; and his



explanation of infantility is not so much in accord with the facts as that given by Freud, who ascribes it to a lack in the development of the affective life—a 'fixation', as he calls it.

Besides these general intellectual deficiencies, there are also certain cases where there are apparent defects in special mental abilities, which must be distinguished from the real innate special defects in children who are otherwise normal. These apparent special defects occur in children who have other symptoms of psychoneurosis. They appear in the course of the neurosis: for example, defect in writing or inability to write at all (a condition which is similar to the psychogenetic writer's cramp in adults), an apparent inability to read which may extend to a complete hysterical amaurosis, or a defect in any of the particular school subjects, all of which can be traced back as the result of mental exploration to emotional inhibitions the result of past experiences.

But the symptoms relating to the affective life are by far the most important and difficult to differentiate. These constitute what is popularly spoken of as emotional instability, which is a characteristic not only of psychoneurotics and defectives, but also of a large class on the borderline, definitely abnormal, not capable of being classified as feeble-minded in the technical sense, and yet with many irregularities which cannot be called psychoneuroses or psychoses. These borderline cases come under the group termed by Adolf Meyer "psychic constitutional inferiority". They are cases of temperamental deficiency, and some would like to include them and certify them under the Mental Deficiency Act. But, although it is often necessary in the case of children to certify them under the Epileptic and Defective Children (Education) Act for the purpose of educating them in a special school, in the case of adults—unless at the same time they show sufficient intellectual defect—however desirable it may be theoretically so to include them, in practice such a course is quite impossible, unless the defect is of such a kind as to come under the definition of moral imbecility.

Emotional instability, a term which as popularly used really means impulsiveness, consists in a want of balance between opposed impulses—innate instinctive impulses on the one hand, and impulses derived from the acquired and controlling sentiments on the other; and all human conduct in adult life must be for the most part regarded as a resultant of these two kinds of impulses—it must be considered as a solution of mental conflict. In all unstable conduct and in the psychoneuroses we have to distinguish between: (1) Those cases in which the primitive impulses are too strong, either as the result of inborn tendencies or as the result of overstimulation in childhood before inhibition is possible; (2) Those cases in which the controlling

sentiments are too weak, either from want of formation and development or from disintegration as the result of disease; and (3) Those cases, which are probably the most numerous, in which both these factors are in combination. For purposes of contrast it might be correct to say that the psychoneuroses come more under the first class and the defectives more under the second class, but it seems possible, and it is distinctly more profitable for the purpose of showing the relation between them, to classify such cases from the point of view of the evolution of the moral character. In such a classification no hard-and-fast line can be drawn between the different classes; they merge one into the other, and it is often difficult to say in the absence of analysis whether the weakness of the moral character was a feature before the illness, or only a consequence of it; for, as in all mental disorders, the first tendencies to cease functioning are those most recently acquired.

I therefore classify my cases as follows:—

1. *Moral imbeciles*—those who have no moral sentiment at all and no potentiality for its development.

2. *Feeble-minded*—those whose sentiments and intelligence cannot develop very far owing to their innate defects, which prevent them from profiting by experience. They form two groups according as their primitive impulses are strong or weak—the impulsive and phlegmatic types of feeble-mindedness.

3. *Constitutional inferiors*—those whose moral sentiments are too weakly organized to deal with adversity. They are egoistic, yet have sufficient intelligence to recognize that they get more advantages from the world by yielding to its demands, but they cannot undertake any responsibility. Their impulses are not necessarily exaggerated. They are just as likely to commit a crime as to develop hysteria when they are up against it, but they differ from moral imbeciles in that they are always very repentant, and punishment has some deterrent effect.

4. *Conversion hysterics*—those whose intelligence may be quite up to the average, but is more often below it, though sufficient to enable them to foresee consequences. They are markedly egoistic, and on the affective side are, like the feeble-minded, undeveloped. Their mental processes take place mainly on the perceptual level, and their symptoms can be removed at once by an appeal to their crude emotions. They refrain from their egoistic acts only through fear of punishment or social ostracism, and not from any altruistic motives. That which stands for the moral sentiment is the fear impulse. They refrain from crime, but when up against it they develop hysteria. They appear to be on the same level as some of the native races, for I would say that this was a common type

amongst those I know best—the Fijians, of whom Deane writes, “As a consequence of his moral deficiency there is no word for conscience in the Fijian’s vocabulary”.<sup>8</sup>

5. *Anxiety states*—those who have developed higher sentiments, recognize their moral obligations and responsibilities, and have altruistic tendencies, but who have not been able to organize them into dominating sentiments owing to the strength of opposing impulses. They are always in a state of doubt, and any prolonged conflict gives rise in them to an anxiety state.

6. *Healthy persons*—those who have some sentiment strongly organized which acts as the sovereign of the hierarchy.

7. *Adolescents*—those who have the potentialities for normal development, but whose moral sentiment is only in process of organization.

8. *Moral dements*—those in whom the moral sentiment has developed normally, but has become weakened as the result of physical factors, injuries or disease. These cases include commotional shock and head injuries, which often seem to produce an alteration in the entire personality. It is remarkable how few of such cases develop a genuine psychosis, for they are comparatively uncommon in asylums; but in those predisposed they cause some slight form of genuine dementia, so that a case of constitutional inferiority, for example, who has a history of minor deficiencies in childhood, becomes clinically like a case of well-marked mental defect, and it is almost impossible to say how much is due to amentia and how much to dementia. The most common effect of these injuries is the disintegration of the moral sentiment, which is the first function to be disturbed. If it becomes completely disintegrated the patient becomes a moral dement and behaves like a moral imbecile, or if it is only weakened he becomes liable to occasional delinquencies or conversion hysteria. Similar effects of a temporary character are produced by organic disturbances, such as auto-intoxication, disturbance of the hormonal or endocrinic balance, and the effects of alcohol and drugs. Instability is common during convalescence after typhoid, influenza, etc., and often during menstruation and pregnancy. Healy quotes Gudden as maintaining that practically all cases of shoplifters were women, who were at the time of their offence in or near their period of menstruation.<sup>9</sup>

There are two other conditions, which cannot be placed in this classification, but which bear an important relation to mental deficiency in that they have to be differentiated from moral imbecility, namely, obsessional neurosis and epilepsy. Some of the impulsions present in obsessional neurosis, true irresistible impulses, have to be differentiated from those impulses which are simply not resisted

-a very important question in relation to criminal responsibility. In his analysis of defective criminals, Goring showed that mental defect is associated the most intimately with stock-firing and with unnatural sexual offences,<sup>10</sup> and these are also common impulses in obsessional neurosis. The diagnosis of obsessional neurosis is generally an easy matter, as the particular impulse is generally associated with other symptoms, minor manias of interrogation, perfection, number pacts, or compulsive ties such as touching lamp-posts or stepping on the cracks of the pavement, and so on. Moreover, such patients are fully aware of their impulses and come of their own accord to be treated for them, whilst they are quite willing to put themselves under restraint to ensure themselves against acting upon them.

The question of epilepsy is much more difficult, and is still a subject for dispute.<sup>11</sup> Pierce Clark's view, that in the so-called idiopathic epilepsies there is a group which is psychogenetic in origin, has shaken our foundations as to diagnosis, for the tests which used to be accepted as evidence of an organic epilepsy are said no longer to hold good, "for the psychoneurotic may not only have aura in their psychic episodes like genuine epilepsy, but they may fall and injure themselves, and in exceptional instances even pass water, bite the tongue, or lose consciousness". But it is the epileptic character with complete ethical depravity, pathological lying, etc., particularly before the onset of fits, or when they are replaced by equivalent symptoms such as violent outbursts of temper, that causes the difficulty in differentiating epilepsy, whether it be of organic or psychogenetic origin, from mental deficiency. So-called psychic epilepsy is still more difficult. In this there is an attack without convulsions, in which the patient does not lose consciousness entirely—he is vaguely aware of everything that is going on, but feels unable to do anything or stop himself from doing anything. He behaves like a man under hypnosis or a man who is not quite fully awake. These attacks may be quite transitory or may continue for days. During them the subject reacts like an automaton to all his impulses, and for the time being he may become a moral imbecile. These attacks of ambulatory automatism occur commonly as fugues in the feeble-minded, and they have to be differentiated from similar states occurring as a genuine post-epileptic phenomenon, or as an epileptic equivalent, or as one of the symptoms of hysteria, or they may be simply manifestations of what might be called an ambulatory instinct, as exhibited, for example, in tramps, and they have then to be differentiated from the conscious running away which is a common delinquency amongst defectives in special schools and institutions.



There is one more relation of greater difficulty which involves the much discussed question of the etiology of the psychoneuroses. Mental deficiency we know to be due to definite organic conditions, innate and, as far as our present knowledge goes, incurable, but the psychoneuroses we speak of, loosely perhaps, as being functional disorders, acquired and curable. Theoretically curable, perhaps I should say. For are they all curable? It would not seem so if we take our pensions budget as a guide. We use the term 'cure' in much too glib a fashion. I am still treating cases who have long ago been 'cured'. Last week I had a relapse case of mutism of 11 months' duration, and he had been 'cured' 18 months previously. All I did was to persuade him that he could talk, which he did quite readily, but he is not cured any more than a tuberculosis patient is cured by relieving him of his cough; and as he is a man of 40 and of a low psychological type, I regard his cure as being extremely doubtful. The views held by different authors as to the curability of the psychoneuroses depend on the class of patients they are dealing with. Youth, plasticity of mind, and intelligence are requisite if one is going to be successful and produce a cure in the proper sense of the term by psychological treatment. Cure can only be spoken of when there has been, so to speak, a reorganization of mental structure, when complete re-orientation has been made possible.

Are we then justified in speaking of all cases of psychoneuroses as functional disorders? Unquestionably the symptoms are of psychogenetic origin. The real difficulty is as to what constitutes the disposition to these accidents. What is the state of mind which allows them to occur? It would appear that both physical and psychical factors play a variable but complementary part, some cases corresponding more to the one and some more to the other, and those in whom the physical factors predominate approach more closely to the feeble-minded. Investigations which I have been carrying out, under a grant from the Medical Research Council, have indicated that there are definite physical differences between cases of conversion hysteria and anxiety states—for instance, the psychogalvanic reflex in the large majority of conversion hysteria cases approaches more nearly that obtained in the imbecile classes. There seems to be little doubt that our temperaments are largely dependent on physical conditions, more particularly of the viscera and endocrine glands, as everyday experience shows our moods to be.

At the same time the rapidity with which a symptom may appear or disappear, the close relation between emotion and the symptom as cause and effect, and the importance of the influence of past experiences in conditioning later behaviour, make it most profitable in the present state of our knowledge to view the psychoneuroses



from the psychological point of view, for it is clear that the immediate origin of the symptom at any rate is a psychogenetic one, and there is no doubt that it is often determined by past experience, whilst we have definite knowledge of the influence of emotion on the functions of the viscera, and endocrine glands.

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## THE INCIDENCE OF SCLEROSIS OF THE CORNU AMMONIS AND CONVULSIONS IN GENERAL PARESIS.\*

By A. E. TAFT, BOSTON, MASS.

SINCE the description by Meynert, in 1893, of sclerosis of the cornu ammonis in epilepsy, this condition has been taken to signify a convulsive tendency.

Anatomically, the cornu ammonis forms a part of the olfactory cortex. In 1867 Voisin called special attention to early anosmia in general paralysis. He considered it of great diagnostic importance, and as a result of his experience concluded that it is almost constant; it is found in no other disease (except local olfactory conditions): it can be identified earlier than tremor of the tongue, inequality of the pupils, or alteration of memory. Mention of this finding has also been made more recently by others, among whom are Dejerine, P. Marie, Ballet and Bloeq, and A. Marie. It has been described as partial, complete, unilateral, and bilateral. Bratz has devoted considerable time to the study of the cornu ammonis with the point of determining its relation to convulsions, and Oppenheim has also discussed the subject. Bratz found sclerosis in 50 per cent of genuine epileptics, and in 20 per cent of general paralytics examined. In the latter he was unable to find a constant history of convulsions, and made no correlation. He failed to find such sclerosis in various other types of mental disease, as acute exhaustive psychoses, alcoholism, apoplexy, tumor cerebri, or mental states in diabetes.

An additional negative report is that of Wakushima, from Obersteiner's laboratory, who examined both cerebral hemispheres from twenty-eight subjects.

Some time ago the writer had the opportunity of examining the brain of an individual who had gone to the hospital with a tentative diagnosis of brain tumour. In the hospital the alternative diagnosis of general paralysis was made. Clinically there were, among other symptoms, convulsions with olfactory aura, and partial loss of olfactory sense. The latter consisted in the inability to differentiate

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\* The work was made possible through a grant from the United States Inter-departmental Social Hygiene Board, Washington, D.C. From the Department of Neurosyphilis, Boston Psychopathic Hospital, Boston, Massachusetts.

odours, although there was some perception of general sensory stimulation. Post mortem, the only notable gross finding was a very evident degeneration of the large pyramidal cells of the cornu ammonis on both sides. Microscopically this could be demonstrated as complete cell loss and extreme gliosis.

In examining histologically the brain tissue from a group of cases of general paresis, sections from the cornu ammonis were included in the series, and it became apparent that there was an almost direct parallel between cell loss in this area, and the incidence of convulsions. The disappearance of the large pyramidal cells inside the corpus dentatum was complete, or very nearly so, in all cases, contrasting markedly with the normal picture (*see Plate I*).

Of the 50 cases studied, 19 (38 per cent) gave histories of convulsive seizures, and of this number, all but one showed loss of the large pyramidal cells of the cornu ammonis; mainly those within the corpus dentatum, but frequently extending in some degree into the pre-subiculum. The areas from which the nerve-cells were absent were in a greater or less degree infiltrated with large amœboid glia cells, or large astrocytes, indicating the presence of a degenerative process. In the one case which was the single exception, a moderate number of astrocytes were present, although no gross cell loss was demonstrable. In this instance it may have been that the section examined was not from the level of the gyrus suffering greatest change. No proof of this was attempted.

The question then arose whether in any instance the change in the cornu ammonis existed without the occurrence of convulsions. This condition was found in only one case. The section here differed from the others histologically, however, in that the loss of cells was apparent only outside the corpus dentatum. This would suggest a functional difference between the cells of the cornu ammonis within the granular layer and those without. The nearly direct parallel between the occurrence of convulsions and the histological findings in the cornu ammonis seems more than a suggestion that there is some definite relation between the degeneration of that part of the olfactory cortex represented by the cornu ammonis, and the convulsions of general paresis.

#### SUMMARY.

Sclerosis of the cornu ammonis was described by Meynert in 1893, in relation to the convulsions of epilepsy. Anosmia has frequently been observed as an early sign in general paresis.

Of 50 cases of general paresis, examined histologically by the writer, 19 had a history of convulsions.

Of these 19, all but one showed extreme loss of large pyramidal

*PLATE 1.*

INCIDENCE OF SCLEROSIS OF THE CORNU AMMONIS AND CONVULSIONS IN  
GENERAL PARESIS.

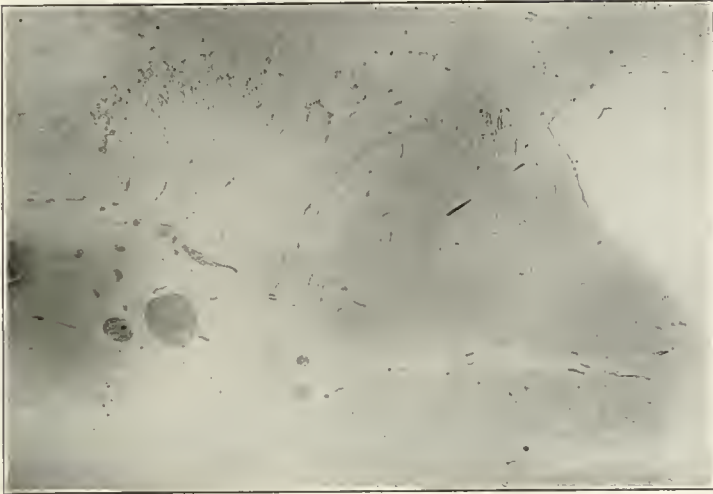


FIG. A.—Cornu ammonis from a case of general paresis with convulsions.



FIG. B.—Cornu ammonis from a case of general paresis without convulsions.





cells of the cornu ammonis; particularly those within the corpus dentatum. In some instances the cell degeneration extended into the pre-subiculum. The cell loss was accompanied by proliferation of large glia cells.

In the entire group of cases there was one contrasting case with loss of cells in the cornu ammonis without a history of convulsions. In this instance there was no disappearance of cells within the corpus dentatum; only from a portion of the pre-subiculum.

Thus, in the histological material examined, there was found an almost exact parallel between the occurrence of convulsions and the presence of marked cell degeneration of the cornu ammonis in 50 cases of general paresis.

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## AN EXPIATION PROCESS IN A CASE OF SCHIZOPHRENIA.

BY HENRY DEVINE, PORTSMOUTH.

### I.

UNDER the heading of *les manies de la réparation*, Janet has described an interesting form of reaction which he has observed in his psychasthenic cases.<sup>1</sup> He has shown that when these patients are obsessed by evil suggestions, they are often impelled to give themselves up to some other activities by means of which they endeavour to atone for and to efface the disagreeable thoughts which persistently obtrude themselves. This mechanism often takes the form of a simple compensation, as in the case of the patient who said, "When I am walking and bad thoughts come into my mind, I pull myself up and walk back a step to correct them; it is as if I corrected a mistake in an account book." In other cases the second action which serves to compensate for the primary one is painful and disagreeable in character, and has the appearance of a kind of self-inflicted punishment. Such reactions Janet includes under the term *les manies de l'expiation*. Thus, one patient mentally promises himself to put himself in prison for five minutes as an expiation for certain indelicate actions. Others, who accuse themselves of blasphemy, of loving their friends more than their family, of having thought of the eucharist in front of a baker's shop, and so on, are similarly impelled to expiate these thoughts by various useless and ineffective acts. Thus, a patient who accuses herself of untruths and immodesty, vows her soul and those of her children to the devil as a punishment; and while such expiatory acts have at first only a personal reference, they soon become generalized, so that she must expiate for an uncle, an irreligious brother, and a politician who died in somewhat unedifying circumstances. She has, indeed, as she says, "rages of expiation for everybody."

### II.

During the last eighteen months I have devoted much attention to the clinical study of a patient who has been insane for some twenty years.<sup>2</sup> As the investigation proceeded, I was surprised to find that the mental activity was almost exclusively directed to the elaboration of extremely complex and fantastic acts of expiation, similar in

character and origin to those described by Janet in his obsessional cases. This case, however, is a psychosis, and differs from those described by Janet in that the primary impulses or thoughts which have to be expiated assume an hallucinatory instead of an obsessional form; otherwise the expiation process is practically identical. A brief history of the case may first be given.

In December, 1918, Mr. A., a gentleman, age 51, was lodging in an hotel at X. One morning, clothed only in his trousers, socks, and vest, he emerged from his bedroom into the corridor, and, walking up to the chambermaid, he struck himself with his braces, and remarked in a loud voice, "Do you for Christ's sake see me knocking myself?" On account of this alarming and eccentric conduct the police were summoned, and as the gentleman was found to be insane, he was certified, and he thus came under my care. On admission he was quiet and composed, his chief eccentricity being the tendency to crawl under the other patients' beds. His explanation of such conduct was inadequate. He said he did it "for fun" because he did the same thing as a child. His mind was perfectly clear, however, and he revealed himself as a well-bred man of high intellectual attainments. He conversed about himself in a general way, but not intimately, and he denied hallucinations, though his whole attitude clearly indicated their presence. He talked vaguely and with reticence about "Strengths", discussing various kinds of strength, supernatural and otherwise. He said, when questioned as to his history, that he was the youngest member of a large family, and that there was a considerable gap in age between himself and his brothers and sisters. There had never been much sympathy between them; they had not understood him and had tended to domineer over him. There had been domestic inharmony, and his father had eventually lived away from home. He had for a time been a medical student, but had not pursued his studies to their completion, and he had lived a wandering life on the continent, leading a somewhat precarious existence by teaching languages. He had spent a good deal of his invested capital and had often been in financial straits. At the time he was certified the patient was evidently in low water, as the hotel in which he was staying was of an inferior type.

For about a year his condition remained unchanged. His demeanour was one of excessive and stilted politeness. He would stand up if I entered the room, make way deferentially for me to pass, take off his hat if he should meet me in the garden, and always address me punctiliously as "Sir". The usual lack of emotional *rapproch* between himself and the environment was present in a high degree. His attitude and expression were like a mask to conceal his thoughts and real feelings. His air of exaggerated humility was, however, in striking contrast to the expression of his eyes, which was indicative of a fierce and antagonistic attitude. His general appearance was, in fact, singularly like a Mephistopheles. His attitude reminded one of a prisoner, who, while outwardly displaying implicit obedience to authority, actually regarded his guardians with repulsion and hatred. His phrasing was stilted and precise, and the words of his sentences were carefully chosen. He exhibited various mannerisms and behaved eccentrically. He would bow to imaginary persons, place a cigarette on the ground and make a series of steps towards and away from it, lie on his face, kneel down, or gaze fixedly at the sky.

He gave trivial explanations for these actions. He would say, "It is necessary that a gentleman should take exercise", or that such actions were not hurtful to others and for that reason "could not reasonably be objected to by an authority". He afforded no opportunity to penetrate into his inner mental life, and he denied hallucinations in the manner peculiar to the schizophrenic.

In December, 1919, however, the patient said he wished to speak to me privately, and he then opened up freely and told me those facts which it was interesting for me to know. His statement, in so far as it relates to the hallucinations, may be briefly outlined. In 1902, while reading in his lodgings in a continental town, he suddenly heard loud voices repeating the phrase "Bey, pay 600 pounds!" This, as I found out later, was a blackmailing threat, the 'Bey' being a contraction of the word 'Obey' which he used to his nurse when a child. These 'voices' have been incessantly with him for eighteen years holding him in conversation, and it was the fact that the constant attention which they exacted from him was beginning to "exhaust his brain" that led him to consult me. He said that he feared that if the annoyance continued he would *lose his reason*. On one occasion he complained to the police and was confined for a time in an asylum in Austria. At first he imagined the voices came from the next room to his, then he felt it must be a trick on the part of people in the street, and finding that this could not be the case, the possibility of hypnotism occurred to him; finally he realized that the experiences must be supernatural in origin and attributable to agencies which he describes under the heading of "Immortal Strengths". It is the activities of these 'Strengths' which it is the purpose of the present paper to consider.

As the patient was often very difficult, irritable, and antagonistic, I did not attempt to utilize the free association method. I contented myself with ordinary conversations, and had to be satisfied with what Mr. A. chose to tell me. Fortunately he seemed pleased to talk, and it soon became evident that the hallucinations were highly organized into a system, and that the case could be regarded as a duplication of the personality. As such we may regard it for descriptive purposes, and I shall endeavour to suggest the significance of these 'Immortal Strengths' by describing, as far as possible in the words of Mr. A. himself, what they said and did, or compelled the patient to do. In the first place it is to be observed that the 'Strengths' are in no sense creative; they give Mr. A. no new information and reveal nothing, but they incessantly throw up the past and interfere with his present thoughts and actions.

"He has gathered from my brain everything I have ever done or remembered", he says. "He is entirely engrossed in my thoughts—a listener informing himself of what I think. He reprimands me for all I have thought or done in a kind of parental authority. It is the rôle of the *elderly-father-bishop* rolling about in my brain. It is as if my childhood were a book. They tear out the pages, as it were, and accuse me of them all. He gets all these things from me; he weighs me down with my own knowledge. Their talk is a kind of tyranny. Their attitude is one of

vicious mastery—they say they are greater than God. They like to punish; they will punish for anything I did in my youth. It is simple wilfulness; a whimsical capriciousness, not proper punishment, but just a delight in punishing. He says it is just his will to punish. He keeps me terror bound as if life would terminate in an hour. He strikes me quite capriciously. He is the sort of person who loves to strike without reason. He is vindictive and revengeful, a mixture of villainy and cunning. He annoys me for the joy of it; it is a semi-brutal attitude, misused strength. They control of me viciously. He has a cantankerous will against me; he is a *continuer* of corrections; a *getter* into vicious states; a *brain trialer* to see how long I can stand him; a pernicious authority correcting me as if I were a child of three; a delighter in dislocating things; a seller of me; a blackmailer; a lover of punishment. He is not a creator but a destroyer—a lover of slighting sex moralities. It is a domination and brutality. Sometimes Mr. A. utilizes metaphors to explain his impressions of the 'Strengths'. "He is like a sloshing bull: like a drunken woman. In voice he resembles a big strong man angry with me as if I were a little child. I put the child as much smaller than a child and him as a great giant—in my mind much larger than anything. My mental picture is just *strength and a voice*. He is like a hectoring schoolmaster whirling a great stick on all around him". At times the 'Strengths' are more genial, a condition which Mr. A. aptly describes in the phrase, "When they pretend to be pleased with me their attitude is a kind of *letting off of punishment*."

We thus see that the patient is in the grip of a very evil force—a kind of personified hatred: and it is of interest to note in passing how effectively this metaphor of size represents his feelings in relation to the 'Strengths'. A similar device was formerly utilized in old paintings, where the king as ruler was represented very large and his inferiors progressively smaller according to rank. The same method of depicting emotional situations of a humiliating and embarrassing kind is also employed in humorous art. At any rate the word-picture of the patient gives us a clear impression of the extent to which these invisible forces control him, and it enables us to comprehend the situation to which he has to adjust himself. As will be seen later, Mr. A. is describing with a good deal of insight an impulse of his own which has determined his reactions to life since childhood, and which has now undergone a process of dissociation.

It will be observed that Mr. A. describes the 'Strengths' as engaged in throwing up his past misdeeds and utilizing them as opportunities for inflicting punishment. Further investigation shows this to be the case, and at the time he confided in me a curious process was going on in his mind. The 'Strengths' were incessantly accusing him of a number of 'offences' which he had actually committed against his relatives and friends in his childhood and youth. That is to say, hallucinatory memories were constantly being revived in the form of reproaches by 'voices' (projection mechanism). I have a



whole list of these offences which the patient has scribbled down on notepaper. They make a curious collection, and indicate a definite sadistic tendency, though not very serious in themselves. The concrete sexual element is only occasionally in evidence, and then it indicates some tendency to perverseness rather than cruelty towards the sexual object. The majority refer to striking people with a whip, which may have some symbolic sexual significance, but of this I have no evidence. It is not within the scope of this paper to discuss the origin or meaning of sadism as such, but the point I wish now to emphasize is that, as Mr. A. is accused of offence by the 'Strengths', so is he forced by them to go through a series of expiatory acts which he describes as "vagaries of praying". These prayers he has written out, and for each offence he will have to 'go through' a prayer as many as 500 times. One example will make the mental process clear. The patient will go through the fact that he "struck the lady wife of Mr. C. on the face, arms, and feet", by repeating the following expiatory prayer:—

"Hear the prayer of me full of remembrance of my faults against persons and children. I beg pardon of those insolent words and bad woundings of the bodies and parts of the bodies of those persons at those times, and in penitent mind I beg them to forgive me those actions wilfully done of me, and those actions done during wilful anger and brutal, vulgar state of vicious joy of wounding against their bodies."

Here then is the same double process which Janet describes in his psychasthenic cases. There are the evil thoughts coming into his mind in the form of hallucinatory memories, and the compensatory expiatory reactions which take the form of endless prayer repetitions. The cruelty (vicious joy of wounding) component of these offences is clearly brought out in this expiation, and a true sadistic (sexual) colouring may possibly be inferred. It is also to be noted that Mr. A. uses here almost identical language as he does in describing the characters of the 'Strengths', the latter being the personification of the impulse which formerly led him to make these attacks on various people.

We all remember Freud's famous dictum that the hysterical patient suffers from reminiscences, and the same may be said in respect to Mr. A. The hallucinations are memories of a particular kind, and it must also be observed that the expiations originate like the hallucinations from the early memories of the patient. The 'Strengths' force him to adopt an attitude of complete submission—an infantile pose. Mr. A. makes this clear when he says:—

"There is no end to my repentances. I say 'I beg pardon of these acts of violence' and the 'Strengths' interrupt me. They make me repeat it slowly in a childlike voice. They think it necessary that a mortal should

pray as a child because his strength is diminished and he is more obedient to them. 'I will be your father, you will be my son', they say."

The expiatory acts themselves are regressive activities, and afford an interesting example of the reanimation of childish beliefs in a patient of high culture.

"They have found out what the clergyman told me, and used it against me. They tell me I have been *read against*, and they force me to confess my faults and be penitent and to give in to the wishes of those in authority. I knocked people about as a child, and they have *read against* me. These 'Strengths' are devils who were asked for to be against me for certain wrongs I had committed against certain persons. I take it that these persons instead of having used their own strength against me have got 'Immortal Strengths' against me."

This strange statement is readily explicable. The expression *read against* is derived from the memories of the patient of the Commination in the Prayer Book, where we read: "In the Primitive Church there was a godly discipline, that . . . such persons who stood convicted of notorious sin were put to open penance, and punished in this world, that their souls might be saved in the day of the Lord. . . . Instead whereof, (until the said discipline may be restored again, which is much to be wished,) it is thought good, that at this time (in the presence of you all) should be *read* the general sentences of God's cursing *against* impenitent sinners."

The meaning of Mr. A.'s statement is thus clear. His father, mother, sisters, and brothers, those, in short, whom he had wronged and insulted, have handed him over to the 'Immortal Strengths' for punishment. The delusion is a regression to the childish belief, 'The devil will take you if you are naughty.' The idea is included in most religious systems, as also in mythology. An almost identical situation is described in Æschylus' *Eumenides*. When Orestes murdered his mother, Clytemnestra, her ghost exhorted the Furies to pursue and torment her slayer, and it is of interest to observe that the character of these Furies is identical with that of the 'Strengths'. Their aim is not to benefit or regenerate their victim, but they are themselves evil and delight in the hatefulness of their office. Like the 'Strengths', it is not "proper punishment" but "just a delight in punishing". \*

It is clear that the 'Strengths' are father substitutes. The father is revenging himself for the thoughts and actions committed by Mr. A. against him in childhood. And by *father* is meant those who were in authority over the patient as a child—especially the elder brother, of whom he has an intense and irrational dislike. The patient did

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\* I am indebted to the Rev. W. H. David, Vicar of Portsmouth, for drawing my attention to the resemblance between the myth and the psychosis.

not kill his father, but he had *death wishes* in respect to him, and for these he has to expiate as for actual offences (omnipotence of thought). All these facts are derived from the statements of the patient himself, as the following quotations show :—

“There are two of these ‘Strengths’—father and son. The father has *gone in* for some months now. They take on the voices of people remembered of me. He poses as my father because I said a child looks up to his father not because of his love but because of his superior strength. It originated first because I said *I did not mind if my father were dead*. He has got punishment on the brain. He likes pretending to be my brother when he was in a domineering way with me. It’s absurd to pose as my brother when I am not a child but a man of fifty. He even uses his phrases and says, ‘You are a person to be mastered’, or uses domineering-like sentences to me such as, ‘Why don’t you take off your hat more respectfully to the gentleman?’”

I shall now endeavour to show the further development of (1) the offences, (2) the expiations. Both these assume increasing complexity and afford a striking example of the process of *displacement*. It will be seen that the ‘Strengths’ do not confine themselves to past offences, but seek new and increasingly ridiculous occasions for punishment and impose increasingly fantastic modes of expiation, so that the inner mental life of the patient comes to consist of a perfect frenzy of accusations and expiations. Like Janet’s patient, Mr. A. has “rages of expiation for everybody.”

1. *The Development of the Offences.*—The patient explains that the ‘Strengths’ are not content with making him expiate for past offences, but they extract from his brain all thoughts of an evil kind he may have now, or may have had in the past about people, and punish him for these. They go further than this. They endeavour to trick him into thinking evil, and then punish him by forcing him to “word to him” or “apologize in extensive form”. The patient explains this as follows :—

“He is getting particular now, and my thoughts cannot always be Christian or pure. I must sometimes have anger, distaste, or ill-will against mortals. They wish my mind to be an effervescing stream, always bubbling up to them. If I am like that I can avoid their anger, but they are tricksters, and make me think evil in order to find fault with me. I can understand a mortal may tell me to sit down and have no blasphemous thoughts for an hour, but the gentleman would not make me sit down and force me to think evil in order to find fault. The only person who could get on with them would be a perfectly thinking mortal. It seems to me he wishes to keep my mind in a *high state of Jesus*. It is walking about in an excessive state of purity, presenting one’s face to be knocked about. He insists I shall have no bad thoughts of people—burning, growing old, or strangling—and yet he tricks me into having them. He makes me act as a repenting person, regards me as a person who must be repentant for all his acts and thoughts since childhood, and yet induces

me mentally to commit criminal acts. This attitude of making me good is incompatible with making me think evil."

The methods by which the 'Strengths' trick Mr. A. into criminal admissions are ingenious, and are thus described by the patient:—

"He (the 'Strengths') is still on with *wordings* about lifelessness. This is what happens. He says to me, 'Do you know Mr. S.? Would you like his wife dead, murdered?' I may thoughtlessly reply 'Yes', just as I might say I wish a woman were dead who annoys me in the street. Or he tricks me into saying 'Yes'—he talks about something else to which 'Yes' should be said, and then suddenly darts this question at me, and I say 'Yes' without thinking. The 'Strengths' then threaten me and say, 'There is willingness on your part that the lady should be out of life', and make me go through *wordings* (expiations) as a penance."

Not only do the 'Strengths' throw down such questions to the patient "2000 times a day", but they twist almost any thought which has the remotest association with death or destruction into a wish to commit a criminal act. Thus not only do such words as *animosity*, *disease*, *strike*, *kill*, *destroy*, and *burn* become "points of danger" for the patient, but apparently harmless words such as *departure*, *arrival*, *growing old* are given sinister meanings by the 'Strengths', and necessitate expiatory acts. These words are distorted into meaning that Mr. A. desires someone's death on the grounds that *departure* implies "going out of life", *arrival* "reaching the next world", and *growing old* that the person will be dead before long in all probability. Indeed, the patient can scarcely think, see, hear, or do anything without his experiences being twisted by the 'Strengths' into a death-wish. The following shows this clearly, and will suffice as an example of a characteristic conversation with the 'Strengths':—

The patient is eating a pear and squashing it with a fork.

Strengths: "Is the pear alive?"

Mr. A.: "No, it is a fruit."

S.: "Is it a body?"

A.: "No."

S.: "Is there an insect in it you may squash?"

A.: "There may be."

S.: "There is a willingness on your part that the insect should be squashed. Apologize to the insect, its wife and family, etc., five hundred times."

It is apparent that the thoughts and actions of the patient must be extremely restricted if he is to avoid punishment. As a matter of fact, practically his whole time is occupied with the apologies or expiations which the 'Strengths' regard as necessary. The patient does, however, make some attempt to avoid any occasion for punishment. He will try, for instance, not to think at all. "I try to keep my mind a blank," he says, "and not to think to him. Unless my



mind is like an empty glass he is constantly asking questions. A kind of sleep or closing of the mind, like a tank with water flowing round, is what I need." More childish methods of evading punishment are sometimes employed by the patient. The 'Strengths' accuse him of "Upsetting a wheelbarrow, murdering a cat, and cutting off a baby's head." "I excuse myself", Mr. A. explains, "by mentally showing him that the barrow is upright, the cat is alive, and the head is on the baby. He is excessively pleased at this, and goes into his childish states." A less fantastic method adopted by the patient sometimes is that of thinking of ideas which are in direct contrast to those suggesting death and destruction. Thus he will repeat to himself such sentences as the following :—

"The flowers are growing,  
The leaves are trembling in the wind.  
The sea waves are moving,  
The sand waves are moving.  
People are passing by."

These phrases all suggest life, movement, and growth, and they have the same purpose as the attempt which people often make to distract their minds from painful reflections by thinking of pleasant things. And they are just about as successful, as the patient himself recognizes when he says :—

"I always say in the early morning, 'I wish all mortals on the face of the earth, born and unborn, to be alive this day : all in life, all in luck', and I think this should clear me for the day. Yet in the middle of the sentence he interrupts me and asks if I am willing that someone should be knocked down, killed, or strangled. If I hesitate, he interprets it that I wish these things done. And if I say 'Yes' he makes me apologize to the man's wife and family."

2. The further Developments of the Expiations may next be traced. It will be seen that just as the 'offences' become more numerous by the process of *displacement*, so a parallel process occurs with the expiations, which become increasingly intricate, fantastic, and complex. The prayer expiations become intermingled with, and replaced by, exceedingly complex mental activities which the patient calls *wordings* or *apologies*. These are not confined to the person supposed to be offended, but must include the whole family group, as shown by the following :—

"He is always making me *word* about *lifelessness*. If he tricks me into consenting that a woman should be murdered, he makes me go through *wordings* as a penance. The *wordings* are an excuse to be begged off of the woman. They are like the prayers—just built up of words. He makes me say, 'They are mortals. I beg pardon of that sentence of words with *kill* in it, for which I beg to apologize. I beg pardon of the lady, her gentleman husband, the uncles, aunts, sisters, brothers, and cousins of



the lady; the uncles, aunts, sisters, brothers, and cousins of the gentleman husband; the sons and daughters of the lady, the babies of the lady, the babies of the lady not yet born. I beg pardon of the babies of the uncles, the babies of the aunts, the babies of the sisters, the babies of the brothers, the babies of the cousins on the lady's side, and the babies of the uncles, etc., on the gentleman husband's side. The grandfather on the lady's side, their sons and daughters growing up, and their babies; the grandfather on the gentleman husband's side, their sons and daughters growing up, and their babies; their relations and co-relations, the son's cousins growing up and their babies'. Thus he makes me go a-begging pardon of the woman."

The above may be regarded as the apology *unit*, and though this might appear sufficiently complex when repeated a large number of times, in actual practice the task of the patient is infinitely more elaborate and fatiguing. The 'Strengths' impose all kinds of additional conditions upon the patient as to the form of the apology. Thus the social position of the person supposed to be offended has to be indicated in the phrasing of the apology:—

"He divides them into ladies, semi-ladies, and common people. The semi-ladies or would-be ladies are those who are always particular to be regarded as ladies and referred to as such. He is particular that I make the right distinctions in *wordings* about these people. It is just a domination and brutality."

Furthermore the apology has to be made without a single mistake, in a particular tone of voice (mentally), and without any interruptions. It has also to be preceded by the following sentence, which set out the various conditions imposed:—

"With refusals, fully leisure (or at the fastest rate), without additions, without omissions, without *giftings* from them, without payment of wishes, without questions; no lies or lies thrown in; with names of persons, names of things; with proper positions of body, head, and neck; with countings, without beggings-off, without re-beginnings."\*

Any mistake made by the patient nullifies the whole apology, and he has to perform the expiation over again the requisite number of times, adding to it a reference to the error he has made.

\* *With refusals*: apology must imply refusal to commit offence again.

*Fully leisure*: apology must not be gabbled through.

*Without additions or omissions*: nothing to be added or omitted.

*Without giftings and payment of wishes*: no favours, such as being allowed to stop apology at bedtime.

*Without questions*: no arguments with 'Strengths'.

*With names of persons, etc.*: person or thing offended to be described in apology.

*Position of body, etc.*: must make apology standing in some uncomfortable position.

*With countings*: must repeat apology the requisite number of times.

*Without beggings-off*: must not asked to be excused on score of fatigue.

*Without re-beginnings*: must not start again until apology is quite finished.

"If during the apology I think the word *tree*, it has to be included in it. With the 'Strengths' it then becomes an improper sentence, and I have to say, 'I beg pardon of the lady without the word *tree* accidentally thought of me, etc.' If I make a mistake he requires me to use more *wordings*. Even if I cough it has to be taken out of the apology."

The last feature of the expiations which I wish to emphasize is that they are not forced upon him to benefit or improve him, but solely to humiliate him and reduce him to a state of complete submission. This is done more effectively by what Mr. A. describes as a *thickening of the apology*—a process which greatly complicates and lengthens it. This term means that the apology must be couched in phrases which imply "an extensive exaggeration of the offended person's position", and the expiation then runs as follows:—

"I beg pardon of the gentleman for that for which I beg to apologize, the highest and greatest in the Empire, the richest minded, richest in authority, and very well rich; I beg pardon of his lady wife of most beautiful framework, well dressed at all times, richest minded, etc."—proceeding through the whole family group, as previously shown.

Mr. A. is not without insight into the absurdity of his expiations, though he is forced to carry them out, for he says:—

"It is just *will* shown in the form of orders. It is perfect rubbish for a man of my age. It is just like a schoolmaster or father making a boy recite lessons. It's mastery of me he wants. He probably gets *wordings* from my childhood when the teacher made me say 'Beg pardon' and then turn round to the class and repeat it."

It must now be observed that expiatory activities are not the only forms of punishment to which the patient is compelled to submit. If he makes mistakes in his apologies the 'Strengths' often knock him about and cause him to have certain bodily experiences of a painful character. We have thus an interesting series of kinæsthetic and conæsthetic hallucinations, a few examples of which may now be given:—

"He gets into peculiar *sudden* states of mind when there is a tremendous rage against me. They knock me about as if I were a baby—knocked about and put to bed. They give me pain in my body and twist my toes. They give me a feeling of crushing in my shoulder blades. It is wilful strength in the form of pains. *They do this because they have got from me what I have seen—a deformed and twisted beggar huddled up in the street.* They struck me in Paris for the first time; they struck me in the form of a battery. He showed this form of strength because he knew I had put coins in a machine which gives electric shocks. At times he says he will strike me as I have struck others. I have the sensation of being struck in the bones or flesh. They do not often knock me over in their angered states: they merely apply strength. They give me the sensation of being crumpled up; the bones and all have that feeling—not broken but crumpled up . . . a sensation of becoming a bag of powder."

A particularly curious phenomenon is an hallucinatory pregnancy phantasy of which the patient sometimes complains. He describes this as follows:—

“He rolls me about. He kind of distends me like a ball inside; like a baby. I tell him that I am not the kind of person who can conceive anything. I only know of what happens from what women tell to men; from what I know of distensible pressure. I know it from diagrams—I was a medical student once. *They are sensations I have thought of*—rocking-horse movements, like the piston rod of an engine. All this arouses tremendous irritability of the mind. It is as if I took hold of a mortal’s chair and rocked it. It would annoy, disturb, upset. He demands all in excess of what the brain can do. He reproduces in me the sensation of being caught hold of, as if in a crowd at the theatre, and forcibly removed by an irascible person.”

It will be noted that just as the ‘offences’ include hallucinatory revivals of past experiences, and just as the expiations are regressive revivals of similar activities carried out in childhood, so are these kinæsthetic hallucinations reproductions of former perceptual experiences which to the patient, because of his peculiar tastes, were a source of pleasure and interest.

These phenomena are very frequent in our insane cases, but it is not usual to find their origin so clearly explained by our patients as they are in the present instance. These kinæsthetic hallucinations bring into prominence the motor and organic aspects of thought processes. They show that hallucinations are not merely thoughts coming into the mind, but they include implicit adjustive activities to an imagined situation which may at any moment issue in overt behaviour (impulses). In perception the stimulus comes from without, in hallucinatory experiences it is derived from an organic need and comes from an urge within. When Mr. A. saw the twisted beggar, his total experience was not confined to a visual perception of the man. Since the experience harmonized with a perverted need, it would be pleasant to him and would provoke agreeable viscera disturbances (emotions). It would provoke, also, nascent movements and attitudes corresponding to the twisted form of the beggar himself, and the patient would identify himself, physically and mentally, with the beggar, and would experience, as it were, a kind of sadistic-masochistic thrill as he looked at him. The hallucinatory revival is physically an actual revival of this thrill just as it occurred in his previous experience. “They give me pain in my body and twist my toes”, the patient says, and in so doing he is describing the kinæsthetic and organic disturbances produced by the nascent movements, tensions, and organic disturbances resulting from the stimulus of his perverted craving which has assumed hallucinatory form.

It is of interest to observe that the ‘Strengths’ do not confine

their physical punishments to a revival of remote experiences extracted from the brain of the patient, but they utilize his experiences of the day. One instance may be given. "If during the day I see a gardener cutting the hedge with sharp scissors and I step on a stone which hurts my foot, he will later use these things against me and will reproduce in my body a *sharp-scissors-stone-pain*."

At times the 'Strengths' get into conditions of extreme irritability, especially if the patient attempts to thwart them. Such experiences Mr. A. describes as follows:—

"They get into excessive states of mind—a mixture of mad baby and half-mad woman. It's extraordinary what they produce—fantastic rubbish, wild imaginations, not of place or things. It's a kind of bordering on anger. I couldn't imagine such rubbishy fantastic stuff. It's a kind of epileptic fit—moving my body and making my muscles quiver. It's extraordinary when he hits out. It's all irrational movements; I cannot describe it in words—only movements. It's like a top at the end of its gyrations, translated into a lot of *wordings*. It's a sort of bad type of diminutive woman—a sort of dwarf, an object of derision."

In this word-picture the patient furnishes an excellent description of the diffuse physical excitement or suppressed hatred and anger associated with the thwarting of an imperative, instinctive need. Another comment suggests itself. If this emotional excitement had discharged itself through motor channels in overt movements it would appear that something would have resulted very like an epileptic fit. The thought is suggestive in light of the view expressed by Stekel that an epileptic is to be regarded as a repressed criminal and the convulsion as a substitute for the criminal act. While such a view is in all probability applicable only to some convulsive episodes, the association between epilepsy and sadistic tendencies has often been noted, as, for instance, in papers by Maeder,<sup>3</sup> Ernest Jones,<sup>4</sup> Read.<sup>5</sup>

It must now be pointed out that the hallucinatory experiences in this case are not exclusively implicit activities, but they find expression in overt impulses and movements. We may again refer to Mr. A.'s statements:—

"They add strength to my limbs. I put my hand on a man's shoulder, and they make me hold with added firmness to hurt him. It may be that the 'Immortal Strengths' put strength in me to hurt him; or they mentally hurt him: or they make him shout so that I shall think I hurt him. I keep from sharp instruments because for mischief they turn it on my hand (masochism). They make a needle prick me, and if I had it in my hand they might make me run against a mortal with it. They give me the sensation of my digging my nails into my palm. Mortals might explain it and say it was my habit to wound myself—a self-wounder. If I put my hand to my head he makes me strike myself. It does not matter with the soft hand, but there might be a hammer in it; and if I take a stick he crashes it on my foot."



Curiously enough, when Mr. A., as sometimes happens, destroys a mattress or some of his clothes, he always protests it was an accident and becomes highly irritated with me, and he is inaccessible and sulky for a few days. Thus, when once he tore his pyjamas, he explained :—

“ I scratch my shoulder; then I catch hold of the skin and muscles, half scratch, half pull; the stuff is weak and goes. It is a little irritable spot on my shoulder. This doing of mine has been done for years.”

The hallucinations do not only determine movements, but they tend to provoke attitudes and muscular tensions :—

“ He is fond of moving organs of my body. He likes to hold limbs in fixed positions, or to keep them still when they are about to be moved. He keeps me in a position of standing with my hands and arms in a position of discomfort. He gets it from my brain that it was done of me at school.”

It will have been observed that the ‘Strengths’ impel Mr. A. to do those very things that they punish him for—injure other people, and so on. The patient recognizes this and explains :—

“ I do not know what they will force me to do. They lurch me against plate-glass windows, and I have to keep away from the gentleman here because they make me strike out at them.”

He believes, also, that they could endow him with their own strength and would use him for their own nefarious purposes if they wished :—

“ He would put me in a position of great power, but he would use me for producing evil—nefarious strength, crimes, murder, committing of crimes of a higher type than yet known to mortals. I could crush up people like tissue paper. They suggest I should create a war in the Universe. This is an absurd enlargement of myself. I know nothing about war, directing armies, the commanding of soldiers. They induce me mentally to commit criminal acts; they would make me a Napoleon among criminals.”

We here detect the notion of omnipotence in these ‘Strengths’, and this, indeed, is what Mr. A. believes them to be: “ They are *enliensed* persons who can do what they will without interference from God”. At times they appear to fuse with the personality of Mr. A. himself and he speaks with their voice, revealing the depths and terror of their power. On one occasion he was beginning to grow irritable with me, and he suddenly said with a look of intense hatred, “ If a mortal offends them he will be struck; he will not get up again; he will go black—gashes on the head; the mortal will disappear if they use their strength against him”. Then the patient recollected himself and muttered, “ I shall have to go through that”, and it was interesting to observe that he was exclusively occupied in prayer expiations for several days after this incident. Mr. A. gives numerous



instances in support of his view that humanity is controlled by the 'Strengths', and when these incidents are examined they are found to be similar in character. Briefly it may be said that any situation which irritates, humiliates, or makes a person look ridiculous, and any accidents, crimes, misfortunes, or cruelty, Mr. A. ascribes to the malicious influence of the 'Strengths'. A few examples will make this clear:—

*An excited lady in the street:* "They rule all mortals and produce effects upon them. A lady went round and round in the middle of the road shouting at the top of her voice. I thought this is not the kind of thing a lady does. I attribute it to *them*. Ladies do not turn round and round in great circles in the road and then go home. It is preposterous." Mr. A. recognizes, however, that the incident is susceptible of other explanations and adds, "Another mortal might have said that she was annoyed of certain doings in the street."

*Some mistake about the time in an hotel, etc.:* "He likes dislocating things. He will make everyone get up at five in an hotel and be very busy. I asked the maid what had happened. She said she did not know and could not understand it. It is a kind of enchantment of people. In the office he makes the wrong papers be delivered to people, and he forces people to sign papers with signatures of a fraudulent kind."

*Injuries to children in the street:* "He behaves like a child because I once said I was fond of them. Especially holding them. I have held children dead and alive in my arms. They like romping with children, but against this is the throwing down of children. They often do this, and I have seen some who were injured of the gravel. He threw them down to see if I would be sorry or commiserate with them. To stop him at times I have had to try continual talking to keep him off the subject. In such cases I have carefully ascertained that there is nothing to cause the children to fall—an obstruction or a stone. The subject first came up when I was watching the children coming out of school—a barrier was placed outside the gate. He was very inquisitive about it, and I explained to him it was to prevent the children from destroying themselves by rushing straight into the street. He amuses me very much at times by placing a lump of earth heaplings in the way—people fall into them and get covered with mud. At times I have seen him remove gratings in the street—people fall into the holes."

*Hallucinatory conversation about man on ladder:* "If I see a man on a ladder he will say, 'Is it safe?' I tell him that I am not interested, but he insists I shall stand there and watch. I stand there for a few minutes and say, 'I think so but of course it *may* fall.' As I walk away he says, 'Look back to see if he is safe.' If the man falls from the ladder it is not my fault; he has thrown him down, but yet he says, 'You wished him to fall. If you had not thought he might fall you wouldn't have given me the idea of knocking him over.' He makes me responsible."

### III.

I have given a somewhat detailed account of this case because it would seem to include features of considerable psychiatric interest.

It is not often possible to gain an extensive knowledge of the inner mental life of patients of this type. As a general rule we only obtain glimpses of the mental processes which determine the reactions of the insane, but here it has been possible to elicit details which make the strange behaviour of the patient quite intelligible. Mr. A. presents outwardly the usual characteristics of many of the insane in our asylums. He is solitary, out of contact, scarcely ever speaks voluntarily, and sits hidden away in corners for hours together; he grimaces, is manneristic, exhibits stereotypies and unmotivated impulses, has an attitude of constraint, and mutters to himself. On the surface his reactions convey no meaning, and it might well be supposed that there was considerable deterioration of the personality. Yet this was not the case. The patient is extremely intelligent, of good memory, and even able to comment upon the absurdity of the life the 'Strengths' compel him to live. The inner mental life reveals an unexpected richness; there is no diminution, but rather an excess of mental activity, and the patient's lack of contact with his environment is in a measure due to the fact that his interest is almost exclusively directed to a purely personal matter which imperatively demands his attention. Mr. A. is, indeed, a very busy man, and to apply the term *dementia* to such a case would obviously be unsuitable.

The next fact of interest which emerges from the study is that the whole symptom-complex is determined by and secondary to the basic process of *dissociation*, and since this splitting of the personality is the fundamental psychic lesion upon which the clinical development of the case depends, Bleuler's term, 'schizophrenia', would seem to be that most suitably used in reference to it. It will have been observed that the psychosis commenced many years ago with hallucinatory experiences (*dissociation*), and it was only after a time that the patient, having explored every other possibility, came to the conclusion that his persecutors were supernatural beings, and he then regressed to rationalizations based upon his early beliefs in order to account for his unaccustomed experiences. And not only the delusions, but all the reactions of the patient develop naturally and logically from the fact that part of his personality has become dissociated. Thus we may say as a clinical fact that all the symptoms are secondary to the primary state of dissociation; that they are psychologically determined; and that, given the situation in which the patient is placed, his behaviour is quite to be understood.

Since the dissociated elements were not isolated and fragmentary, but were highly organized into a definite hallucinatory system, it has been possible to gain some insight into their origin and nature, and more especially so as the split-off mental processes take the form of a clear-cut and definite secondary personality—the 'Immortal

Strengths'. We estimate the character of an individual by his speech and actions, and from the account which has been given of the activities of these 'Strengths', it is apparent that they are expressive of a personality of primitive type of development, of unlimited strength and of unbounded egotism—savage, cruel, ruthless, aggressive, and destructive. The predominating traits are an overwhelming lust of domination, a callous indifference to suffering, and a delight in the infliction of pain. The hallucinatory content exhibits a definite uniformity of theme, and it is exclusively concerned with subjects relating to death, violence, and crime. There is here not merely a tendency for hallucinations to occur, but rather a tendency to experience hallucinations of a particular kind. The images coming into the mind in dissociated form are thus not haphazard, anarchical, or indifferent: whether they are derived from actual memories or are aroused as associations of perceptual experiences, they are always consistent in character.

The definitely selective character of the morbid process is perhaps one of the most interesting facts elicited by this study, and it enables the conclusion to be drawn that the dissociated personality is expressive of an impulse in the patient which finds its satisfaction in acts of cruelty, homicide, and bloodshed—"a vicious joy of wounding" which includes even such a perverted need as "the excessive maiming of animals". This frenzied pleasure in indiscriminate acts of cruelty has already been referred to under the term *sadism*, and I think this most suitably includes its activities as a whole. It is not here proposed, as previously mentioned, to discuss the origin or significance of sadism as such. The details of the early life of the patient are too scanty to justify such an attempt. To what extent the love of cruelty, teasing, and irritation here personified by the 'Strengths' is to be regarded as a deviation of the sexual aim I do not know. The patient barely referred directly to his sexual life. The basic need embodied in the 'Strengths' appears to be more a lust for power than a form of sexual satisfaction, but any discussion of this subject would necessarily pivot round what is meant by and included in the term sexual impulse. I feel that this need is something more fundamental than even sex, which is here a component rather than the need itself. Such terms as Schopenhauer's *will to live* and Nietzsche's *will to power* come into the mind in reviewing the activities of these 'Strengths', and the instinctive craving they personify might be interpreted, in accordance with Adler's theories, as the outcome of an infantile struggle for power ("der männliche Protest"). As I wish to discuss this case in its broader psychiatric implications I will not further refer to these delicate matters, but will endeavour briefly to expand the view that this sadistic trend, this vital impulse expressed in the form of hatred and

eruelty, has been the determining factor in the formation of Mr. A.'s character, and that the actual psychosis is only a further stage in its development.

In support of this view a few details of the early history and character traits may be given. From his early childhood the existence of some abnormal trend in his character became apparent. He was always difficult. He behaved as if every man's hand were against him; he was intensely suspicious, secretive, obstinate, aggressive, and self-willed; he showed extreme irritability at any attempt at control, and he developed an intense hatred of his family, his teachers, and, as he went into the world, the whole of humanity. At times, even when grown up, he exhibited episodes of passionate violence against his relatives, thereby causing them much anxiety and distress. Perhaps, however, it is from the content of the hallucinatory memories that we gain the most insight into the early sadistic tendencies of the patient. There are the 'offences', or memories of actual acts of violence: there are the kinæsthetic hallucinations which betray a morbid pleasure in the sight of suffering; and there are the death-wishes and acts of childish destructiveness which the 'Strengths' continually 'throw up' at him. All these trends prevented the patient from adjusting himself to life. His erratic behaviour forced him to relinquish his early career, and he went through life a solitary, restless, uneasy man, hating humanity and the world in which he lived.

It is thus clear that a strongly sadistic tendency had existed since childhood, and that it had exerted an important influence upon the actions of the patient. I would now stress another feature in the make-up of Mr. A. of some significance in relation to the content and structure of the psychosis. I refer to the primitive and almost savage simplicity of his emotional attitude. The patient is, and apparently always has been, utterly devoid of affection, sympathy, kindness, and altruism; he aggressively repudiates the right of anyone to interfere with him, even for his own benefit, and he accepts gifts ungraciously; he regards all the higher social sentiments with contempt and suspicion; and he thinks human beings should be 'like bits of iron'. I have already pointed out the resemblance between this psychosis and the obsessional neurosis. And this resemblance is indeed close both in respect to pathology and structure. There is a similar dual process in each: the evil impulses, ultimately derived from hatred and sadistic wishes, and the complementary protective measures expressed in the form of expiatory and ceremonial activities. The two types in some respects are in striking contrast, however. Mr. A. is aggressive, hostile, manifestly hating, and unable to co-operate, while the psychoneurotic is sensitive, gentle, self-depreciatory, and willingly co-operating because of his need for help and reassurance



These differences in make-up would seem to depend on the fact that in the psychoneurotic the hatred impulse is repressed by a reaction-formation taking the form of sympathy, pity, and sensitiveness to pain and suffering, whereas in the case of Mr. A. the development of these higher social sentiments is conspicuous by its absence. The anti-social sadistic trend would here seem to have been inhibited by the crude instinctive tendency to submit to the will of the herd. Such reactions as horror and shame to evil thoughts or impulses seem to have been foreign to the character of the patient, and we may perhaps say that this gives the psychosis the note of remorse and retribution rather than that of repentance and forgiveness. The most deeply ingrained and primitive attitude to the world is one of aggression, hatred, and hostility. The world is something which menaces and threatens; it is something to be overcome in the interests of self-preservation. A similar reaction occurs in the child when its self-assertive impulses meet in the parental inhibitions an obstacle to their free expression, and it may be true, as Freud has said, that hate rather than love represents the earliest attitude to the outside world. It is just in this way that Mr. A. has always regarded the world, and it is for this reason that I would express the view *that the psychosis is the outcome of an arrest or fixation of the instinctive and emotional life at a primitive or infantile level.*

The influence of the father in the determination of the emotional attitude of the child pervades the case. The whole psychosis is, indeed, an exquisitely subtle criticism of, and comment upon, the parental rôle. The childish attitude of Mr. A. to his father was clearly one of hatred. We know nothing about the father, nor have we any intimate details of the early life of the patient; but the content of the psychosis makes it certain that rightly or wrongly he appeared to the patient as a sinister figure of enormous strength who not merely punished but derived pleasure from so doing. And as the patient grew up he viewed the world from the same angle—the father dominates his whole life. For Mr. A., human beings, organizations, the Church, police, governments, and nations seemed to find their highest satisfaction in viciously imposing their will on others. This is the guiding principle of human conduct, and all sentiment is so much camouflage. Every human being strives to become an ‘authority’ in order that he may ruthlessly dominate his fellow creatures. It is interesting to observe, moreover, how the father-complex determines the philosophy of the patient. He broods on the notion that the tendency throughout nature is for the strong to exterminate the weak; that in consequence many animals and races have become extinct; that even in plant life the plants are destructive; that “they absorb more nourishment than they need, for the superfluous satisfaction of



their stomachs"; that "they crunch up insects for the *joy of destruction*"; that by this destruction "they increase their strength and intellect at the expense of others"; and that "these destructive activities are equal to the destruction of 100,000 men." Thus the patient erects a god in the image of his father, and in so doing he perhaps affords an interesting example of how our scientific views are apt to be influenced by our emotional attitude to life.

It must next be observed that implicit in this attitude of hatred is an attitude of admiration. The father, and by the process of displacement the whole world, is an object of hatred as "Strength and a voice"; but he is also an object of admiration to whom it is a pleasure to submit in virtue of his strength—"a child looks up to his father not because of his love but because of his superior strength." In this dual attitude we see the germ of ambivalency in the sadistic impulse which reaches its culmination in the psychosis. The father and his later substitutes become the ideal as well as the hated oppressor, and inasmuch as this ideal is unable to find expression in appropriate sadistic activities, the patient obtains satisfaction by an attitude of masochistic submission. It is interesting to observe in conversations with the patient how he gained a wealth of knowledge of the underworld of crime, and also of the methods of the police in stamping it out. He derived equal satisfaction from the contemplation of each aspect of social life. This dual attitude found a curious mode of expression in the pleasure the patient used to derive from standing near a policeman to look as if he were guilty of some crime. He thereby found sadistic satisfaction such as he would have experienced in actually committing the crime, and a masochistic satisfaction in submitting to the penalty. Thus there is here a double process of identification, and Mr. A. punishes himself for his own crime. The same ambivalency characterizes the attitude of the patient at the present time. To myself as the 'authority' who is responsible for his detention his attitude is one of masochistic submission, shown by a subservient politeness, from every detail of which he plainly derives much satisfaction; combined with this, however, is an almost inhuman hatred which peeps out in every direction and which embodies all kinds of death wishes—wishes for which he has subsequently to expiate.

Here then is an individual who, since childhood, had been the subject of a perverted instinctive craving which prevented him from harmonizing with life and which kept him in a state of uneasy tension. Like all instinctive needs, this craving would urge the patient into appropriate activities leading to its gratification, but in this case its anti-social character would render its free expression impossible. A man cannot go about the world "committing crimes of a higher type

than yet known to mortals". To a certain extent no doubt the sadistic trend was partially sublimed in cultural interests with a strongly sadistic colouring, and it was also able to find an outlet, a kind of strangled expression, by means of phantasies, appropriate perceptual activities—e.g., the beggar in the street—and occasional acts of explosive violence. We may suppose, then, that a point was ultimately reached when the accumulated energy of this perverted biological impulse was unable to find an adequate outlet, and the development of hallucinations is to be regarded as the final break at a moment of a too severe tension. The hallucinations occurred many years ago, and any special factors determining their occurrence cannot now be elicited, so that we must confine our views to the general statement that the sadistic tendency assumed hallucinatory form by virtue of its own inherent elemental force. In hallucinatory form the abnormal craving is free to expand. Before the development of the psychosis the patient had to *seek out* situations which would feed his abnormal trend; in the psychosis these situations are mechanically and incessantly provided by revived memories of past experiences. The 'Immortal Strengths' are the personification of a purely primitive and instinctive need. It seems hardly correct or appropriate to apply any ethical term such as *evil* to this craving. It is just an elemental impulse seeking its own inherent ends. It is a-moral rather than evil; and perhaps the 'Strengths' afford us some insight into the behaviour of a human being unrestrained by any social, ethical, and moral inhibitions. Mr. A. expresses this aptly when he describes them as "*enlicensed persons* who have been given permission to do what they will without interference from God". Perhaps most human beings have sometimes sighed to be *enlicensed persons* even for a little while, and perhaps, also, there is a tendency at the present day for this sigh to become articulate.

The 'Immortal Strengths' are completely irresponsible, an attitude seen more particularly in the childish states they sometimes assume. "Both of them", the patient says, "take the part of my children. These children are of tremendous strength—greater than God." In this infantile pose the 'Strengths' are utterly impossible, capricious, and irritating. They make incessant demands, play all kinds of malicious pranks, have to be fussed, amused, taken out to tea shops, the theatre, and so on. They make Mr. A. thief, forge cheques, give them large sums of money, build houses for them, and so keep him in a constant state of irritating activity. At times they make the patient do even stranger things, such, for instance as standing on his head on the sloping roof of the villa 5000 times—as Mr. A. remarks, "an absurd thing to be done of mortals". Naturally these activities are only performed mentally, and it is of interest to note

how subjective preoccupations of this kind attain a greater reality-value to our patients than do environmental situations. As has already been shown, the 'Immortal Strengths' are to the patient omnipotent, and they express in this, as in every other way, all that the sadistic trend of the patient would urge him to be and do. They are wish-fulfillments; a reincarnation of the father in the form of a god.

The reactions of the patient to the 'Immortal Strengths' afford, I think, a striking example of the ambivalency of the sadistic impulse. It has often been pointed out that sadism and masochism occur constantly together, and in this case we see how the active, aggressive component of the sadistic-masochistic impulse turns against the subject, compelling him to submit to all kinds of pain and humiliations. It is usual for one of the ambivalent tendencies to become increased when the other is inhibited, but here the condition of dissociation permits us to observe the ambivalent tendencies in operation at the same time. The expiations show how the masochistic attitude is exactly opposite to the sadistic one. The two form a perfect contrast. The 'Strengths', with their qualities of omnipotence, aggressiveness, pleasure in cruelty, and devilish criminality, impose on Mr. A. an attitude of passive helplessness, humility, slavish submission, and a perfection of thought and action (an excessively christianized state). The patient is forced to be subservient to those whom he despises and would gladly exterminate. The 'Strengths' tell him he must take the "lowest state of position", and that he must behave to everyone around him as if they were princes and people of great wealth. He is compelled, even, to abase himself to insects and jelly-fish—and apologize to them in a mood of the utmost humility. And there is no doubt that the expiations are a source of strange pleasure to the patient. His intense interest in the details of his punishments, the pains he takes to carry them out with accuracy, and the expression of almost lustful pleasure on his face as he busily occupies himself with his ceremonial acts, all indicate that his tasks afford him a kind of unboly satisfaction. When one talks to him his manner reminds one of a child who is compelled to attend to the conversation but whose restless eagerness shows that he is longing to get back to some more congenial pursuit. If we pursue the notion of ambivalency further, the thought suggests itself that the psychosis reveals the existence of a bisexual attitude. From this point of view the aggressiveness and cruelty of the 'Strengths' may be regarded as an exaggeration of the masculine sexual attitude, and the pleasure in submitting to these aggressions represents the opposite feminine attitude. It is not infrequent for insane cases to have delusions of a bisexual nature; but Mr. A. does not explicitly state this, and his

notion of personal identity is, of course, not affected by the psychosis. At any rate, the pregnancy phantasy shows that the patient in some instances assumes a definitely feminine rôle, and he sometimes hints that the 'Strengths' subject him to concrete sexual aggressions at night, though he says nothing as to their nature and is most reticent on this subject. How far the masochistic expiations are to be regarded generally as a means of perverted sexual excitement it is impossible to say, and the same comments are applicable here as those made in respect to the sadistic component.

Thus it would seem that this psychosis can be traced to the fact that, while the intellectual development of the patient reached a high level, his emotional life was arrested at a primitive or infantile level. In the emotional sphere the patient failed to grow up, and the question naturally arises as to how far this fixation of libido or life force was due to traumatic environmental influences in childhood. Since the father influence pervades the whole development of the patient to such a remarkable extent, it may be that the psychosis was ultimately due to an unwise upbringing. It is easy for a father to exploit unwittingly a child as a medium for his love of power, and to adopt such an attitude that he irritates him and thereby creates situations which afford him an opportunity for the infliction of punishment. Such an attitude may have unfortunate effects upon the growing mind of a child, the results of which may be incalculable; but to stress unduly the influence of environment in the production of a psychosis may blind us to the influence of inborn factors which have to be taken into account. The biogenetic psychoses give a general impression of inevitability which suggests that they are the product of inborn inferiority; but our present state of knowledge scarcely justifies any dogmatism or fixity of view on this all-important problem. What this case does seem to demonstrate is the disastrous influence upon the personality of a perverted instinctive trend. The whole psychosis may be traced to a *wish* in the Freudian sense. Savage has used the term 'morbid mental growth' to emphasize the fact that mental disorder may originate from small beginnings,<sup>6</sup> and we certainly see in this case how an abnormal tendency in childhood gradually influenced Mr. A.'s whole outlook on life, how it moulded his character, wrecked his career, isolated him from friendly contact with other people, impelled him to wander restlessly about the world finding no peace, and how, finally, like a cancerous growth, it invaded the personality and drove him into an asylum. I am well aware that such a view is regarded with disfavour by many psychiatrists. Thus Kraepelin writes in referring to the work of Jung<sup>7</sup>: "The idea of independent parasitic neoplasms, which on the one hand are completely drawn from the influence of the ego, but on the other hand



are able wholly to transform it and almost annihilate it, would overthrow such a number of thoroughly ascertained psychological experiences, that its substantiation must in any case be supported by quite other means of proof than has hitherto been the case". In spite of these views I think it is perfectly reasonable to explain the case along the lines suggested. Indeed the case may be said to explain itself. In this psychosis nature herself has revealed those facts which the psychopathologist endeavours to elicit by an artificial process, and I think the revelations of the patient, in which suggestion can altogether be excluded, do much to confirm some of the basic principles advanced by Freud in his various works. This view is expressed with all the more confidence as this investigation was not started to prove or disprove anything, but merely to record the statements of the patient.

The psychosis would thus seem to be the inevitable product of elemental forces beyond the control of the patient. As a social unit Mr. A. was a kind of cave-man—perhaps inherently so—and the psychosis may thus be regarded as the natural outcome of a condition of biological inferiority. Modern life provides no adequate outlet for the kind of things the patient would wish to do. All the energy of the organism which should be utilized in the work of social adaption is here absorbed by a craving which from its nature cannot be expressed by actions in relation to the environment. The psychosis has a biological function: it affords a means by which the craving is actualized and finds free expression. It is easy to see that the psychosis brings about a condition of dynamic equilibrium. The insatiable need which ultimately finds expression in the 'Immortal Strengths' derives its energy from the life of the organism and must issue in appropriate motor activities. The structure of the psychosis makes this possible. It has been shown that each hallucinatory suggestion (impulse to action) provokes an immediate response on the part of the patient in the form of expiatory activities, and it is through the medium of these expiations that the energy of the affective craving finds a channel of release. These mental activities involve nascent or actual movements of the organism, and it is by such reactions that the release of tension is constantly effected and a state of equilibrium thereby maintained.

On one occasion Mr. A. remarked, "My mind is fast becoming a Mississippi flow of words. Any one whom the 'Strengths' get hold of will be ultimately reduced to a *mass of jumbled up wordings*". Perhaps the patient is here predicting with a good deal of truth the terminal stage of the psychosis from which he suffers. This would mean that his abnormal craving gradually absorbs more and more of his energy, and he is forced to perform more and more complex acts



of expiation. Objectively the patient would become more inaccessible, and perhaps the only evidence of mental activity would be a few apparently meaningless fragments of his apologies. In spite of appearances there would actually be no real deterioration of the personality, and the condition presented would be more accurately described as a progressive narrowing of interest than as a true dementia. Such reflections give some colour to the view that many of our patients who present some such clinical picture as the above are not really demented, but are rather absorbed in matters of greater personal significance to them than the ordinary interests of life.

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- <sup>2</sup> DEVINE, "A Study of Hallucinations in a Case of Schizophrenia", *Jour. of Ment. Sci.*, 1921, lxvi, 172. (I am indebted to the Editors of the *Journal of Mental Science* for permission to publish extracts from this paper, which contains a partial description of the case.)
- <sup>3</sup> MAEDER, "Sexualität und Epilepsie", *Jahrb. f. psychoanalytische u. psychopathologische Forschungen*, 1910, i, 119.
- <sup>4</sup> JONES, *Papers on Psychoanalysis*, 1920, 455.
- <sup>5</sup> READ, "Study of Epileptoid States in Soldiers", *Jour. Abnorm. Psychol.*, 1918, xiii.
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## Short Notes and Clinical Cases.

### REPORT OF A CASE OF INSOMNIA FOLLOWING ENCEPHALITIS LETHARGICA.

By MAURICE COBURN, London.

ALTHOUGH cases demonstrating the various sequelæ of encephalitis lethargica have been recorded in vast numbers in England, yet among them there do not seem to be many with marked insomnia and nocturnal irritability as predominant features. Under the circumstances, the publication of the details of such a case does not seem to be out of place.

C. H., age 8, no previous illnesses, began in April, 1920, to develop drowsiness, manifested by sleep when he sat down, although previously he had been a bright and lively boy. His appetite began to fail and his sleepiness persisted; the patient sleeping immediately after dinner on the night following the commencement of his illness. The following morning, while the patient was asleep, his mother noticed both lower limbs become alternately flexed and extended, the right upper limb adducted and abducted, recurring attacks of twitching of the right side of his face, and eyes which seemed to roll about under half-closed eyelids. She woke him up several times, and spoke to him, but he appeared to be too drowsy to answer, and went to sleep again after the cessation of stimuli. This apathy extended to food, for he hardly ate anything that day. At night he seemed feverish and was given a dose of castor oil. He slept quite well despite the continued twitchings of the right upper limb and the occasional jerks of both lower limbs.

The following day he was brought to the hospital—the right upper limb still twitching—and, complaining only of a sore throat, was diagnosed as a case of tonsillitis or early scarlet fever, and was sent home with instructions to report himself if a rash appeared. He remained drowsy throughout the day, and vomited once. During the next day drowsiness still persisted, and the arm-jerks became worse, his upper arm nearly touching his chin during the movements. He was seen a day later, and, the anticipated rash not being present, was sent to an infirmary, where he remained from April to November,

the drowsiness persisting for nearly five weeks. At that institution he was diagnosed as a case of chorea.

Soon after the patient's admission to the infirmary, the twitchings of the lower limbs ceased altogether, whereas those of the upper limb continued unabated; and about three months after the onset of the illness, i.e., about July, 1920, the observant mother once again noticed a change, in that the neck muscles seemed to be weak, the head falling forward and the chin practically resting on the chest. To counteract this weakness a high collar was worn.

During his period of drowsiness, it was with great difficulty that he could rouse himself to answer questions. Even then his reply was an unintelligible sound, and he made no spontaneous remarks. Every little action seemed to be too much trouble.

In August, 1920, when all signs of drowsiness had long been left behind and the patient was running about the wards quite fit, eating well, and putting on weight, there came a remarkable reaction. He could not get to sleep at night. He tumbled and tossed, sat up in bed, played with his toys, and occasionally tried to stand on his head; and it was not till 2 or 4 a.m. that at last sleep came. This state of affairs persisted throughout the remainder of his stay at the infirmary; and at one time the proposition of an operation for cerebral tumour was seriously considered. Thus he continued, too, while he was at a convalescent home for a period of three weeks. From there he returned home, and his mother, describing his first night, said that he started at each sound, and twitched and turned during the whole of the night. He seemed to be in a kind of stupor, being neither asleep nor awake, with both eyes open. He answered when spoken to; and throughout the night he made repeated attempts at blowing out an imaginary candle. That night, too, he had incontinence of urine. He was admitted to Guy's Hospital on April 22, 1921.

**On Admission.**—The patient is rather small for his age, but quite sturdily built. His gait is peculiar and simulates that of a man with paralysis agitans. His head seems poised rather too forward on his body, and is held rather rigidly in that position, his neck muscles being in a state of hypertonus. There is little expression on his face with the exception of a transient smile which now and again plays about his lips. The upper limb is kept flexed at the elbow and wrist, and the fingers, too, are kept in semiflexion. There is no automatic movement of the limb on walking, the only movements being involuntary twitchings, which are exaggerated when the patient is asleep, and which will be described later. His left arm swings normally. His steps are short and rather rapid, but there is no tendency either to propulsion or retropulsion. On being addressed, the patient will look at his questioner with eyes raised, his head being

kept fixed. His speech is staccato in character. Mentally he is quite bright, though temperamentally he is somewhat nervous.

### Examination of Central Nervous System.—

#### *Cranial Nerves.*—

I. The patient is able to distinguish different smells.

II. The pupils are equal in size, and react to light but not to accommodation—the reverse of the Argyll-Robertson pupil. The visual fields and the fundi are quite normal.

III, IV, and VI. Eye movements normal in degree and equal in extent. There is definite nystagmus on looking to right and to left, the latter movements being coarser, slower, and of less extent than the former.

VII. There is definite though slight facial weakness on the right side, which weakness becomes intensified and much more noticeable on emotional movements such as laughing, smiling, and yawning.

No abnormality can be detected in the other cranial nerves, except that the tongue, which is very tremulous, deviates slightly to the right when protruded.

*Musculature.*—The muscles of the right upper limb are in a state of tonic contraction of slight degree as compared with those of the left side. The right upper limb is held flexed at an angle of  $150^{\circ}$  at the elbow and at the wrist; and there is semiflexion of the fingers, with the thumb approximated to the index finger and the forearm in a semiprone position. This limb is periodically adducted and the fingers flexed through the clonic contractions of the following muscles:—

1. Pectoral group of muscles: 2. *Latissimus dorsi*. These muscles are most pronounced in their contractions, which can readily be seen and felt.

3. *Biceps brachii*. Tendon can be palpated readily in the antecubital fossa.

4. *Pronator radii teres*, which keeps the forearm in the semipronated position.

5. The flexors of the fingers and wrist. The fingers and thumb can readily be seen to contract clonically at the metacarpophalangeal and interphalangeal joints.

6. The rhomboid muscles. Their action in drawing the scapula inwards can be appreciated by placing the hand on the superjacent skin.

Other muscles most probably play their part, too, but it is very difficult to be certain. Of these, the small muscles of the thumb and of the little finger, the muscles of the hand, and perhaps the supinators, are the most important.

These movements seem to be due to clonic contractions of the above-mentioned muscles, and there does not seem to be alternate contraction of their antagonistic muscles. No contractions can be detected in the deltoid, triceps brachii, or extensor muscles of the hand. The rate of the contractions varies between 80 and 90 per minute, being greater at times of emotional stress than under normal conditions. No fibrillary twitchings could be detected.

On testing both grips, it is found that the right grip is definitely the weaker, and the flexors of the forearm and the adductors of the upper arm are also slightly less powerful than the corresponding muscles of the opposite limb.

*Reflexes.*—The reflexes of the upper limbs are present, though diminished in extent, and equal on the two sides. The abdominal reflexes are brisk and equal. The knee- and ankle-jerks are brisk on both sides, though slightly more so on the left. The plantar reflex is definitely flexor on the right side, whereas a doubtful extensor is obtained on the left side.

Cutaneous and deep sensibility and sense of position are all normal; as are the cardiovascular, respiratory, alimentary, and genito-urinary systems.

The patient's first night at hospital was typical of practically all his nights. At 10.30 p.m., when all the other patients were asleep, he simulated a boy suffering from a very bad attack of chorea. With eyes practically closed, and unconscious of all external surroundings, he wriggled about in bed, lying first on one side and then on the other. Shooting out both legs alternately, thus kicking the bedclothes from off him, he would pursue his manœuvres covered by a nightshirt only. At times he would be in a position of opisthotonus, followed shortly afterwards by the praying attitude of the follower of Islam. At times his movements would become so violent that he would bump his head against the sides of the bed, and it required a very vigilant nurse to prevent his falling on to the floor. During the whole of this period the twitchings of the right upper limb would continue unabated, and after a varying interval the patient would suddenly become conscious of his environment, sit up in bed, and smile. Incontinence of urine was a not uncommon accompaniment.

Attempts to determine reflexes, especially the plantar reflexes, were made during sleep, but were very soon followed by violent movements, making further tests impossible. As the result of many such attempts, I am inclined to say that the right plantar reflex is definitely flexor, and the left most probably extensor.

The patient was warded for over a month, and despite the fact that an undisturbed night's rest was a rare event, he seemed to suffer



no ill effects, beyond the fact that he felt sleepy in the morning, which is not at all surprising, as he did not start his night's rest till 2 a.m. Throughout the day he would be quite cheerful and run about the ward, but, if he were given an opportunity to lie down, he would soon be asleep and would sleep well, the clonic twitchings of his right arm being the only movements present.

Treatment was very disappointing. As a first resource hypnosis was attempted. This proved tolerably successful the first night, less so the next, and finally it had to be given up, as the patient would not keep still for any length of time. Following this, medication by chloral and bromides by night and increasing doses of hyosine hydrobromide by day was tried, with somewhat better results. If the chloral were given in the early hours of the evening, the period of nocturnal activity seemed to be diminished, but the twitchings were not appreciably affected by the hyosine. Leahy and Sands<sup>1</sup> in America reported a number of similar cases in which they found that "a warm pack in the milder cases and a wet pack in the more disturbed, was conducive to sleep and allayed some of the irritability. Hydrotherapy and massage were also utilized freely." Hydrotherapy was not employed in this instance, because that therapeutic measure was found to be unavailing in similar cases. I examined the patient again two months after his discharge from hospital, and he was not one whit the better. There must be many such cases in the country, and one wonders what is the ultimate prognosis.

In conclusion, I wish to express my indebtedness to Dr. Symonds, under whose care the patient was in hospital, for his permission to publish the details of the case.

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## NOTE ON A CASE OF PREMATURE SENILITY (PROGERIA).

BY C. FARRAN-RIDGE, DARENTIL.

In the present defective state of our knowledge of the factors regulating growth and development it seems worth while to make a

record, however fragmentary and incomplete, of any case in which the normal mechanism is manifestly out of gear. Accordingly I offer for consideration the following brief note on a case which cannot readily be assigned to any of the recognized clinical types of disordered growth.



FIG. 1.—Patient at the age of four years.

(Photograph taken by Dr. Brushfield.)

The patient is a little boy of 9 years, who immediately arrests one's attention by his peculiar appearance, presenting as he does an incongruous mixture of childhood and old age. In size and manner of dress he looks a child of five, but his shrunken face and deep-set eyes are those of an old man.

**Family History.**—This, so far as it is known, tells us nothing, though phthisis occurs among the antecedents on both sides.

**Personal History.**—The patient is the fifth child in a family of eight, and was born in May, 1912. The confinement was a difficult one, and his mother states that right from birth the child looked old and his appearance was peculiar.

He is said to have been thrown out of a push-cart on to his head at the age of ten weeks. Shortly after this accident he developed

some wasting disease, and was treated in different hospitals for a long period without a cure being effected.

When two years old he suffered from an ulcerated mouth, and his lower incisor teeth fell out spontaneously. He was admitted in an ill-nourished marasmic condition to the Fountain Mental Hospital in May, 1916. He was then four years old, and weighed only  $28\frac{1}{2}$  lb. His case-sheet records that he was wet and dirty in his habits, and had to be fed and dressed. He was, however, able to walk, and could say a few words.

In January, 1917, he began to gain a little in weight, and to show some mental improvement also. By March, 1920, the child had improved so much that it was possible to transfer him to the Darenth Training Colony.

He has at one time or other suffered from most of the exanthemata, and it is not surprising that he has been troubled with an intermittent otorrhœa from an early age. The anterior fontanelle closed very late. He was late in walking and late in passing all the other milestones of development.

**Present State.**—As previously mentioned, the outstanding point about the patient is his old-mannish appearance. In stature he is stunted, his height being 41 in. The head is hydrocephalic in shape, with a circumference of  $19\frac{1}{2}$  in., as compared with the age average of  $20\frac{1}{2}$  in. An x-ray photograph shows a normal sella turcica.

The scalp is covered with hair, but the latter is not abundant and appears to be growing thin, especially in the region of the temples. There is a small patch of white hair near the occiput.

His face as a whole is small compared with the cranium. The eyes are sunken like those of an old man, but there is no arcus senilis. The nose is diminutive, and the root of the nose is retracted. The lower jaw is relatively very poorly developed. The angle is sub-normal; it would almost appear as if Meckel's cartilage had persisted



FIG. 2.—Patient at the age of nine years.

unchanged. The alveolar ridge is shallow and atrophic, analogous to the condition met with in old age. The first permanent molars and the upper central incisors are normal; the lower central and lateral incisors are absent. As a result of the defective development of the lower jaw the upper lip overhangs and overlaps the lower.

His tongue is small in size, and long and narrow in shape. The tonsils are not enlarged. His neck is distinctly small, and the skin over it is wrinkled and pigmented. The thyroid gland is not palpable.

A striking feature is the redundant and wrinkled skin covering the abdomen. The testicles are undescended. The hands and feet



FIG. 3.—Patient at the age of nine years.

are cast in a fine mould, and are disproportionately small. Nurses have always remarked that the patient has doll's hands. His muscles are firm and well developed for his size. The recti abdominis stand out very prominently.

Neurologically there is nothing to note. The pupils are equal and react to light and accommodation. The knee-jerks are active, and the plantar reflexes are flexor. There is no sensory loss. The percussion outline of the heart is normal, and there are no signs of valvular disease. His pulse-rate is 86, with a regular rhythm. No

evidence of disease can be detected in the lungs, and the abdominal organs appear to be normal. The blood gives an absolutely negative Wassermann reaction.

In his psychical development one finds little correlation with his physical appearance of old age. Within his limitations the boy is bright and alert and takes an interest in the daily happenings in the ward. He plays with the other children, and is not specially sedate or grown-up in manner.

His mental age is 4 years and 2 months. His intelligence quotient is 46, bringing him into the imbecile class.

**Discussion.**—There is certainly more than enough in the patient's personal history to account for a general retardation in his development. But it is the peculiar nature and distribution of the abnormalities that is interesting, suggesting that we have to do with a disturbance of a special growth-mechanism.

It will be observed that in many respects the patient presents a picture which is the reverse of acromegaly. All those parts which are over-developed in acromegaly are found to be under-developed. The retraction of the root of the nose may be contrasted with the great boss which is thrown out from the frontal bone in a similar situation in acromegaly. In acromegaly the lower jaw is greatly hypertrophied and is thrown forwards, so that it often projects below the upper jaw. In the patient the lower jaw with its alveolar process is markedly atrophied. The circumference of the neck is distinctly small, while in acromegaly it is notably large. In acromegaly the hands and feet are above all uniformly enlarged, while in the patient they are uniformly diminished in size. An interesting question for consideration is how far the present case is identical with the condition named progeria by Hastings Gilford.<sup>1</sup>



FIG. 4.—A normal boy of the same age is introduced on the right for comparison.



It seems to me that the two conditions are closely related, the essential connection between them being the fact that they both present, as it were, the obverse side of the medallion of acromegaly. In progeria we have the same wrinkled skin and the same appearance of senility as in the present case, and in both we find indications of mixed premature and immature development. There are a number of minor differences; for instance, in the case described by Hastings Gilford baldness was one of the most striking signs. Further, there was no mental deficiency, and the psychical attributes of old age appear to have been more marked.

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## Critical Review.

### THE PATHOGENESIS OF TABES DORSALIS.

By W. J. ADIE, LONDON.

IN a paper admirable alike for its thoroughness and lucidity, Richter<sup>1</sup> has recently made a communication which marks an epoch in the history of his subject. After reading it one feels that the hitherto impenetrable fog engendered by hazy notions of meta-syphilis, elective degenerations, hypothetical toxins, and all the other unknowns which have been invoked to explain the obscure has at last been dispelled: for this author has described a lesion in tabes which is primary, essential, and *constant*, a lesion in which the spirochæte is demonstrable and one which represents a *direct* and *local* reaction to the virus of syphilis.

This tabetic process is an inflammation of the sheath of the nerve-roots, which begins at that point above the sensory root ganglion where the dorsal and ventral spinal roots converge to form the radicular nerve of Nageotte. The reaction in this situation to the presence of the spirochæte—the tabetic granulation—presents peculiar histological characters. It is mainly fibroblastic, and arises by proliferation of the endothelial cells of the lymph channels and the fixed connective-tissue cells of the nerve-sheath. Infiltrative cells of hæmatogenous origin, lymphocytes, plasma-cells, etc., are almost entirely absent, and diffuse and perivascular infiltrations such as occur in syphilitic lesions of other parts are foreign to the tabetic lesion. Beginning in the lymph and tissue spaces of the common sheath formed by the fusion of the dura and arachnoid, the inflammation spreads inwards along the septa between the nerve bundles, and as sclerosis occurs the nervous elements themselves are damaged, and the fibres degenerate proximally. The degenerations in the posterior columns are entirely secondary, and are the natural outcome of the root lesion. The anterior roots suffer least, because they usually pierce the common sheath and leave the subarachnoid space before they reach the point at which the tabetic process begins. Meningitis in the usual sense, i.e., inflammation of the pia mater, is a frequent complication of tabes, but plays no part in its production. The lesion in the cranial nerves is an interstitial inflammation which attacks them in the proximal portion of their extracerebral course. In all with the structure of peripheral nerves the same tabetic

granulation is found. The olfactory and optic nerves, however, differ from the others in that they possess a pial sheath and contain supporting tissue of ectodermal origin. In these, therefore, the inflammation is the same as that seen in the pia mater and glia in other parts, and perivascular infiltrations with plasma-cells and lymphocytes are prominent.

This short summary is enough to show that Richter's views differ materially from any that have hitherto been propounded. They are based on a thorough examination of twenty-four cases—twelve of pure tabes, ten of tabo-paresis and two of tabes, complicated by cerebrospinal syphilis. The nerve-roots were examined in serial section, and from these alone, apart from sections of the cord, ganglia, and cranial nerves, some ten thousand finished preparations were made.

If his findings are confirmed, no one will deny that the epithet 'epoch-making' is applicable to them, for they put an end for ever to the already discredited conception of metasyphilis, and they terminate the age-long dispute between the adherents of the toxic and meningeal theories by showing that the truth lies in neither.

Richter himself is very modest in his claims to priority. He states that his discoveries confirm in the main those of Nageotte,<sup>2,3</sup> and considers that the part of his work which has most claim to originality is that dealing with the histology of the tabetic granulation. But a perusal of Nageotte's papers leaves the impression that this writer was never quite sure of his ground. In an early paper he emphasized the lesion in the radicular nerve, and stated clearly that meningitis was not constant. He spoke of an *infiltration embryonnaire* in the roots—undoubtedly the *Granulation* of Richter—and did not mention perivascular and infiltrative lesions. Later, however, in his book on the pathogenesis of tabes, he describes a lesion in the roots identical with meningitis, and looks upon the tabetic process as a spread to the roots from the inflamed meninges—no tabes without meningitis. For him the degeneration in the posterior columns is the initial nervous lesion. It is an *atrophie lente* which, though dependent on a lesion of the radicular nerve, appears first in the intramedullary portion of the root fibres. This degeneration is at once radicular and systematic (*à la fois radiculaire et systématique*), and the motor roots suffer least because among other reasons they are more resistant to the syphilitic toxin. His *périnévrine radiculaire*, therefore, on his own showing is not the primary and adequate lesion in tabes, but is merely one factor in its causation. Having slain the monster which had impeded progress so long, he allowed it to raise its hydra heads—electivity, systematic degenerations, unequal susceptibilities to toxins, meningitis, and so on—and his theory gained but qualified acceptance.

In contrast to Nageotte's latest conception, Richter holds that meningitis is an inconstant accompaniment of the lesion in the radicular nerve, that the primary nervous lesion appears at the site of the tabetic granulation, whence degeneration extends to the posterior columns, that the distribution of the early degenerations in the various zones of the posterior columns can be explained without recourse to any theory of systematic degeneration, and that the relative escape of the anterior roots is explicable on purely anatomical grounds. In spite of these minor differences, however, both writers agree on one fundamental point, the importance of the lesion in the radicular nerve, and as it is almost certain that a modification of Nageotte's original theory will soon gain general acceptance, it is of interest at this point to consider some of the causes which have delayed the recognition of extramedullary root lesions as the prime factor in the pathogenesis of tabes.

One of these causes is found in the work of Obersteiner and Redlich,<sup>1</sup> who published the results of their important studies a few months before Nageotte's first paper appeared. These observers drew attention to a constriction of the posterior root at the point where it pierces the pia mater and loses its neurilemmal sheath. This part of the root, they said, is a *locus minoris resistentiae* which is damaged mechanically by inflammation in the meninges and by the pressure of sclerosed pial blood-vessels. From this point the fibres degenerate, first in their intramedullary and later in their extramedullary portion. This purely mechanical theory was not accepted in its entirety, as it was soon shown that in many cases changes in the meninges could not be demonstrated, and that when meningitis was found its severity bore no relation to the intensity of the nerve lesions. The anatomical peculiarities of the root at the point they described, however, were generally accepted as of great importance, and this part of their work has influenced the writings of almost every investigator in this field. Their strongest argument against those who postulated a lesion in the ganglia or in the extramedullary portion of the nerve-roots was that the degenerations in early cases appear first in the intramedullary part of the sensory fibres. This argument, which is probably based on a false assumption, has gone unchallenged up to the present day, and is constantly used by those who support the notion that the lesion in tabes is a primary degeneration of the sensory fibres in the posterior columns.

To overcome the difficulties presented by the incongruities of the purely mechanical theory, it was assumed that, with or without meningitis, a toxin might damage the nerve-roots at the vulnerable point described by Obersteiner and Redlich, and in this modified form the theory has survived.

We cannot illustrate more clearly the most unsatisfactory feature of the meningeal theory—its multiplicity of factors—than by quoting some of the conclusions of a writer who describes himself as a supporter thereof. *Tabes*, Schaller<sup>5</sup> says, is due to a degeneration of the posterior roots. Subacute syphilitic inflammatory changes in the subarachnoid space (posterior leptomeningitis, meningeal and neural involvement of the radicular nerve) are in etiological relationship with the degeneration of the posterior roots. The manner in which this subacute inflammatory meningitis produces degeneration is as yet uncertain; it may act by direct extension of the meningeal lesions to the nerve-roots, causing a meningo-radculitis; or by pressure constriction from sclerosed meninges; by toxic products engendered by this inflammation; or even by increase of the fluid pressure, as in the case of posterior spinal root degeneration in brain tumour. These causes may act together or independently. It is hardly necessary to say that, if Richter's conclusions are correct, this list of surmises which masquerades as a theory must also be abandoned, for neither meningitis nor imaginary toxins play any part in his account of the production of the disease.

The theory of the elective systematic distribution of the degenerations in *tabes* next demands consideration, for its protagonists still hold out against those who have favoured an extramedullary origin for the disease.

It is founded on the fact that in early cases the degenerations appear with unequal intensity in different parts of the posterior columns, so that certain regions are more or less sharply delimited. Strümpell, the founder of this theory, considered that each of these regions contained groups or systems of fibres, each with biological peculiarities and different degrees of vulnerability. He held that the noxious agent in *tabes* was a general toxin with a special affinity for the intramedullary portion of the sensory root fibres, and that this toxin destroyed the different systems of fibres in the order of their vulnerability. Flechsig's researches on myelinization seemed to lend strong support to this theory, for they showed that in certain stages of this process regions similar to those seen in *tabes* were marked off, and especially that the changes were always most intense in the middle root zone. He saw herein a parallel between the march of the process of myelin formation and the degenerations in *tabes*, and concluded with Strümpell that both were systematic, and that the various systems contained independent systems of fibres of which in *tabes* the most vulnerable perished first.

This, the so-called toxic-elective theory, has always had many supporters, because it provides an explanation on many points where the meningeal theory fails. The posterior columns are affected whilst



other parts are spared because the all-pervading toxin has a special affinity for the intramedullary portion of the exogenous sensory fibres; the middle root zone shows the most intense changes because it contains a system of fibres to which the toxin is particularly obnoxious; and so on. But it cannot be said that an explanation such as this gives much intellectual satisfaction. It reminds us of Molière's student who, when asked why opium produced sleep, replied that the drug possessed a dormitive virtue whose nature it was to allay the senses, an answer which satisfied his learned examiners. Serious students are referred to Richter's paper for a closely-reasoned statement of his belief that both the apparent preponderance of the degenerations in the intramedullary portion of the sensory fibres and the apparent systematic nature of the degenerations, especially the early changes in the middle root zone, are explicable in terms of anatomy and histopathology. He has our sympathy when he states that his guiding principle in this part of his exposition has been that the principle of electivity, both in myelinization and in tabes, should not be accepted until all other possible explanations have been exhausted.

One of the most influential supporters of the primary elective theory is Professor Schaffer,<sup>6,7</sup> whose article on tabes in Lewandowsky's *Handbuch* has become a classic. It was at his instigation that Richter's research was undertaken, and his discussion of the bearing of this work on his own long-held views makes interesting reading. He considers that Richter's work justifies the following conclusions: that in tabes the radicular nerve of Nageotte is the constant seat of a purely proliferative process, at first peri-, later endo-fascicular, which is characterized by proliferation of the endothelial cells of the lymph channels and the fixed connective-tissue cells of the nerve-sheath; that in uncomplicated cases of tabes infiltrative cells of hamatogenous origin are absent, but that in tabo-paresis lymphocytes and plasma-cells may be found in the nerve-roots as well as the tabetic granulation cells; that the tabetic granulation is quite independent of alterations in the meninges, meningitis being a frequent but inconstant accompaniment of tabes. Tabes, therefore, is not a result of the action of a syphilitic toxin: it is not a primary toxie-degenerative form of cerebrospinal syphilis, but is the natural outcome of the local action of the spirochæte in the nerve-root: the degeneration in the posterior columns is secondary to the affection of the roots, so that one should no longer speak of a primary elective disease.

Schaffer thus adds the weight of his great authority to Richter's work; but after making these handsome admissions, he proceeds to review Kaufmann's<sup>8</sup> article on the myelinization of the posterior

columns, and succeeds in finding reasons therein for believing that the degenerations in tabes are partly elective after all. Whilst admitting our great need for a single cause, he considers that in the present state of our knowledge a dual conception of the lesions in tabes is still necessary. His final standpoint is that the attack of the spirochaete on the spinal sensory protoneurons leads to the formation of multiple local lesions which, though damaging the fibres haphazard, produce degenerations which are only explicable on the assumption that the roots contain systems of fibres of which the more vulnerable degenerate first. With all due deference we consider that Schaffer's conclusions are unfortunate, not because the point at issue is a very important one, but because of the principle involved—that of explaining obscure points by pure surmises, when provable explanations have not been exhausted. He bases his conclusions on the early and intense changes in the middle root zone, that great Serbonian bog where whole armies of writers on this subject have sunk; but it is highly probable that both the early myelin formation and the early tabetic degenerations in this zone depend on the fact that it is one through which all the root fibres pass before they spread to their several destinations, and is therefore just the place where the alterations in both instances must be most obvious.

Be this as it may, the original toxic theory has given ground on every important point, and Richter's modification of Nageotte's hypothesis bids fair to win the day.

As a milestone from which progress in recent years can be measured, we may choose Redlich's statement of the problems still awaiting solution in the year 1897. He presented them in the form of two questions: Is the degeneration in uncomplicated cases of tabes confined to parts of the posterior columns connected directly with posterior roots? If so, is it confined to certain fibres of the roots—in other words, is it a systematic degeneration as Strümpell and Flechsig held, or a degeneration of all the fibres of the root? To the first question an almost unanimous answer has been given in the sense that it is the exogenous sensory fibres, and these alone, which degenerate in cases of pure tabes. The qualification regarding unanimity is necessary, because Schröder,<sup>9</sup> and more recently Hassin,<sup>10</sup> Thorne,<sup>11</sup> and others, have described scattered interstitial lesions in the spinal cord as characteristic of tabes. But this evidence, if accepted, would render the root theory untenable, for it is unlikely that degenerations following lesions of this nature would be confined to the exogenous sensory fibres. It is now well known that tertiary syphilitic lesions are common in the brains of paretics, and it is not surprising that similar changes should be found in the cords of tabetics. The fact that the material on which these discrepant observations

are made is often obtained from asylums is not without significance. Hassin's cases, for example, were said to have suffered from taboparesis and tabetic psychoses. The latter were considered to be pure cases of tabes so far as the histological changes were concerned, but nothing is more probable than that their psychoses were really a part of general paralysis or of cerebrospinal syphilis. Observations such as these served a useful purpose when evidence was needed in support of the contention that the so-called metasyphilitic diseases were direct results of syphilis, but it would be unfortunate if they were thought to support any theory of tabes so reactionary as to place the primary lesion within the substance of the cord.

When Redlich formulated his second question, it was thought that a decisive answer thereto would settle the differences between the toxie-elective and the various extramedullary root theories. In a sense the answer to this question has been given, for it is hardly likely that anyone will now maintain that tabes results from the action of a toxin which has a special affinity for the intramedullary portion of the sensory fibres; but, as we have seen, one at least of the adherents of the elective theory, by shifting the point at which electivity acts from the posterior columns to the posterior root, and by substituting the direct action of the spirochæte for the action of a toxin, is able to reconcile a lesion in the root with the principle of electivity, so that a final answer to Redlich's second question has not yet been given.

Nevertheless great progress has been made in the last thirty years, if only because the tabes question has been freed at last from the mystic epithet 'metasyphilitic'.

It is hoped that this short review will draw attention to Richter's work. It merits, indeed demands, the serious attention of everyone who is interested in the pathogenesis of tabes dorsalis.

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## Editorial.

### FAMILIAL AND HEREDITARY NERVOUS DISEASE.

OUR knowledge of the large group of degenerative nervous affections, hereditary or familial as they often are, has scarcely progressed beyond the stage of mere description. In no class of disease, perhaps, has study of morbid anatomy been pushed to more barren limits or failed more signally to furnish a clue to treatment than in this, where, commonly enough, to become the victims the subjects have only to be born of the same parents and reach the age marked out by fate. Here, if anywhere, lies a problem for preventive medicine; if we knew what gives to the parents "*le triste privilège de procréer de tels enfants*" we might perhaps be able to neutralize the mischief at its source. Simple diagnosis of a case of pseudohypertrophic muscular paralysis, mere addition to the pathological records of Friedreich's disease, seems nothing less than futile as long as tracing the stock and investigating the progeny is ignored, or the question of determining how germ-plasm and antenatal development are warped remains unsolved. It has been asserted with some degree of truth that we know less of the blood lines of our human stock than we do of our cattle. In the 17th century three brothers sailed from England to America, and it appeared then to matter less than nothing that one of the parents suffered from hereditary chorea; but had they on that account been refused permission to land, America, in the words of Charles B. Davenport, "would have lost two leading educators, a surgeon or two, two or three State assembly men, and several ministers, and—900 cases of one of the most dreadful diseases that man is liable to, that produces individuals who for half a century know no waking hour free from forced movements, often of a violent character, and in whom often the mental functions one by one deteriorate". When, in conjunction with the embryologist, the biometrician, and the experimental pathologist, devotion on the part of the neurologist to the basic problems of nervous heredity takes the place of mere exhibition of familial cases, when morphological examination of a fifty-year-diseased brain and cord is abandoned in favour of biochemical investigation during the life of the individual,

when marriage selection ceases to be a Utopian dream, while the perpetuation of familial nervous disease becomes a reproach, only then will a genuine advance in the therapeutic direction have been made.

At present, speculation has to take the place of facts. A distinction has been drawn between the inheritance of structural or physiological anomalies recognizable at birth and remaining unchanged, and of 'tendencies' to the development of degenerative states in later life. The direct inheritance of structural trifles such as syndactyly or crooked little fingers, of physiological abnormalities like colour-blindness or left-handedness, can be worked out on a large scale in suitable families and shown to lend some support to Mendelian laws on the transmission of dominant and recessive characters: but in actual hereditary and familial nervous disease we do not know what 'tendency' really stands for, nor whether it is in the strict sense congenital. Clinical experience constantly gives us examples of one and the same familial nervous degeneration appearing either in infancy, or in adolescence, or in later life, so that the line between congenital and adult dysgenesis loses significance. From a practical viewpoint it signifies little whether a myopath has "never used his limbs properly" or only "since he was knocked on the head at school": of greater import is the difficulty in the application of Mendelian principles to the data concerned.

Dr. Bateson, whose work on Mendelianism lends authority to his dicta, doubts whether many of the family affections are illustrations of heredity at all, in the biological sense, and suggests some may be due to "actual transmission of a disease-germ through the reproductive cells". Yet for Huntington's chorea and for some occasionally sex-limited inheritances such as peroneal muscular atrophy and pseudohypertrophic muscular paralysis, for Leber's atrophy and myotonia atrophica with or without cataract, we cannot conceive a hereditary factor to be wanting, whatever it be, and however it fail to conform to Mendelian rules.

For early and late degenerations alike the theory of 'abiotrophy' has been suggested by Gowers. Virtually identical is the theory of "premature physiological senescence of certain organic systems" of Raymond, a process whose date of onset varies with the individual and the disease and is independent of any external factor, whereas Gowers is willing to admit occasional excitation by some extraneous cause, of itself inadequate to produce the enduring effect. According to the *Ersatztheorie* of Edinger, on the other hand, degeneration ensues on insufficient repair of normal nerve-cell and nerve-fibre waste owing to defective nutrition, which in its turn is occasioned either by hereditary nervous weakness, or by injury, or the action of a toxin, as the case may be.



There are, however, difficulties in the way of acceptance of each and all of these hypotheses. To ascribe solely to muscular exertion, consequent waste, and subsequent failure of repair the proximal atrophy of the Erb myopathy and the distal atrophy of the distal type, alike, is to assume a difference of preceding muscular activity in the two instances which is unreasonable. If we believe, with Gowers and Raymond, in the congenital gift of a limited span of life for the affected systems, we are confronted with the difficulty that the degenerative process often fails to single out these in their entirety. Amyotrophic lateral sclerosis is cited as the motor neurone degenerative disease *par excellence*; but in it irregular involvement of certain sensory systems is very commonly remarked. Stress has been laid on the absence of any histological evidence of inflammatory reaction in the degenerative or familial group as an argument in favour of the abiotrophic view, but the neural atrophy that undoubtedly occurs in the so-called 'deficiency diseases' is proof of the action of other factors than abiotrophy in the production of nervous degeneration. Some familial affections, such as periodic family paralysis, or familial myoclonus-epilepsy, can indeed scarcely have any structural lesion for their basis, some antotoxic process or metabolic error being more plausible. It is surely permissible, too, to hold that morbid function may play a part in effecting structural change.

No one theory is of universal applicability in the difficult question of familial nervous disease. Occasionally direct inheritance of fixed characters may be postulated, but in most familial affections the variations are such as to frustrate any effort to explain them by the laws of heredity, and we are driven to the assumption that toxic, glandular, nutritional, and other factors may often determine the onset, decide the incidence, and prescribe the course of the disease, especially when it makes its appearance in an isolated and sporadic way.

## Abstracts.

### Neurology.

#### NEURO-ANATOMY AND NEUROPHYSIOLOGY.

- [105] On localization in the ocular nerve nuclei and on two hitherto unrecognized nuclei in the mid-brain (Ueber die Lokalisation in den Augenmuskelnervenkernen und zwei noch unbekannte Kerne in Mittelhirn des Menschen).—CASIMIR FRANK. *Jour. f. Psychol. u. Neurol.*, 1921, xxvi, 200.

THE author bases his careful researches on a series of preparations, stained by Nissl's method, from the brain-stem of a case of tabes, in which the clinical condition was one of complete ophthalmoplegia externa and interna, with the exception of the external rectus, of one eye.

Among the more important conclusions are the following:—

1. In all probability the Edinger-Westphal nucleus is the mesencephalic centre for convergence, controlling synergic movement in convergence of the rectus internus and the sphincter iridis. Probably the accommodation centre is the same as this. On the other hand, the centre for reflex contraction of the pupil to light is certainly not situated in this nucleus, but is perhaps to be placed in the Boettiger-Westphal nucleus in the central grey matter and in the nucleus rapheos posterior.

2. Both lateral large-celled oculomotor nuclei, with the central nucleus of Perlia, form an anatomical and physiological unit, and limited localization of individual muscles in these cell-groups is not to be sought. All cell-groups are equally concerned in ocular innervation.

3. The fibres from the trochlear nucleus are doubly crossed.

4. An apparently new group is called by the author the nucleus sub-fascicularis, and probably mediates synergic action between the levator and the upper facial muscles. The medial part of this nucleus seems to be the hypothetical mesencephalic upper facial nucleus.

A second new cell-collection is called by Frank the nucleus intracomisuralis of Wernickink, but its physiopathology is at present unknown.

S. A. K. W.

- [106] Release of function in the nervous system (Croonian Lecture).—H. HEAD. *Proc. Roy. Soc., B*, 1921, xcii.

THE author takes as his text Hughlings Jackson's law that destructive lesions cannot produce positive symptoms. The apparent greater activity following destructive lesions is due, not to irritation, but to release from control of the activity of lower centres. He cites the familiar spasticity

which follows organic hemiplegia and the mass reflex which is established after recovery from the shock of complete division of the cord. He next describes the thalamic syndrome of sensory changes accompanied by excessive reaction both to pleasurable and painful stimuli. As he points out, this comes on in the course of recovery and cannot be due to irritation, but is due to the release of the more primitive thalamic centres from the control of the cortical centres.

He then describes his experiences in the course of the recovery of the divided sensory nerve. These are characterized by loss of discrimination, intense vividness, and modified all-or-none reaction. In this form of sensory perception the extensity of the stimulus is of greater importance than its intensity. As epicritic sensibility is restored, this characteristic protopathic response becomes less evident, but it may be temporarily restored if, before complete recovery, the epicritic type of sensation is interfered with by exposing the area to excessive cold. In studying the distribution of the ulnar and median nerves it is found that, while tactile fibres are limited in area, the pain fibres of each overlap to a considerable extent. If one of these nerves is injured, protopathic sensibility is never referred to an area beyond the distribution of the tactile fibres; but where the over-action is really due to irritation, as happens in some cases of causalgia, the area coincides with that of the pain fibres, and the condition may be relieved by section of the whole nerve. It must be remembered that phenomena observed when phylogenetically older centres are liberated from higher control are not always seen in their simple purity, for the fate of such lower areas varies, some being suppressed and inhibited, others being caught up in the action of the higher areas.

In the second part of the paper the author points out that the stimuli which the body receives from the environment are exceedingly complex. At the spinal level the afferent impulses set off reflex activities and are grouped together according to quality, so that pain impressions proceed together, touch impressions together, and so on, to give rise to sensations. At this level there is a great increase in the possible varieties of response. The sensation itself is the result of the struggle for dominance between several sensory impulses, as when a stimulus is applied to the hand which is capable of calling out heat, cold, and pain at the same moment. Illustrations of this sensory conflict and its results are given by experiments on the glans penis and the viscera. Reference is made to the generalization and spread of pain when central resistance is lowered, as occurs with a rise of temperature, or during menstruation, or in anaemia. If the resistance is very low from constitutional or other reasons, pain may be very readily felt, and the distribution and order of development of the pain will not correspond to ordinary visceral or segmental areas, so showing the pains to be of central and not of peripheral origin. Control may be established over perfectly normal sensory impressions, as for example the control over giddiness acquired by the aviator, but this control may be lost again if the general health of the subject is lowered from any cause.

This paper is an exceedingly lucid résumé of Dr. Head's original work, which does much to confirm and carry on the observations of Jackson

and Sherrington and to demonstrate how the nervous system integrates and controls the functions of the body.

R. G. GORDON.

### NEUROPATHOLOGY.

- [107] Histological examination of the nervous centres in a case of acute Sydenham's chorea (Examen histologique des centres nerveux dans un cas de chorée aiguë de Sydenham).—P. MARIE and C. TRÉTIKOFF. *Revue neurol.*, 1920, xxxvi, 428.

THE material investigated consisted of the brain and spinal cord of a young girl, who died in an attack of acute chorea on the tenth day of her illness. The authors summarize the results of their researches as showing infiltration by inflammatory products both of the perivascular sheaths and the nervous substance, together with destruction of the nerve-cells in certain areas. The inflammatory process is very diffuse and irregular, and beginning around the vessels involves the whole cerebrospinal axis with the exception of the medulla and cerebellum, which appear absolutely intact. Thus the spinal cord, pons, cerebral peduncles, the basal ganglia, and the cerebral cortex are the sites affected. The changes are most marked in the grey matter of the basal ganglia. The process has a selective incidence upon the grey matter: in contrast, the centrum ovale, corpus callosum, and cerebellar peduncles are intact. The process, therefore, is to be considered as a polio-encephalitis.

The writers describe the nature of the lesions in detail, with appropriate figures, and point out their close resemblance to those found in encephalitis lethargica. They consider, however, that in the case under investigation the cerebral cortex was more extensively involved than is usual in the other disease.

Commenting upon the similarity of their findings to those described by other authors, they consider it as established that histological changes of this type are found in children dead of acute chorea. They further draw attention to the correspondence between the especial localization of the lesions in these cases and the findings of Marie and Lhermitte in Huntington's chorea, the areas most affected in both instances being the cerebral cortex and the corpus striatum. No clinical details are offered in proof of the accuracy of the diagnosis in the case which is the subject of this paper, and, as the authors themselves point out, the differentiation of a case of Sydenham's chorea from one of encephalitis lethargica with choreiform movements may be no easy matter. In view, therefore, of the histological picture described, the reader may perhaps be excused for wondering whether they were not dealing with a case of the latter disease.

C. P. SYMONDS.

- [108] On the histology of poliomyelitis acuta and encephalitis epidemica (Zur Histologie der Poliomyelitis acuta und der Encephalitis epidemica [lethargica]).—O. HÄUPTLI. *Deut. Zeits. f. Nervenh.*, 1920, lxxi, 1.

THE object of these investigations was to determine, first, the extent to

which polymorphonuclear leucocytes participate in inflammatory processes in the nervous system; and secondly, the origin and nature of the cells which are found in the infiltrations around the vessels and in the nervous substance. To this end, using a method which is free from objection—the oxydase reaction—the author examined a number of cases of poliomyelitis and encephalitis lethargica. His most important conclusion is that polymorphonuclear leucocytes play a much greater part than recent writings have lead us to believe. He found that up to the third or fourth day the great majority of the cells, both perivascular and within the nervous substance, were polymorphonuclear leucocytes; in other words, that the cells described by Wickman as polyblasts, and by Wallgren as polyblasts, polymorphonuclear glia cells, and degenerated leucocytes, are in reality almost all derived from them. After the fourth day altered polymorphonuclear leucocytes are replaced by polymorphonuclear cells of glial origin in the intranervous infiltrations. In the lymph spaces the polymorphs also disappear rapidly, and in a few days lymphocytes and plasma-cells alone are found around the larger vessels. Around the smallest vessels a few polymorphs of glial origin may be found in the later stages. In agreement with Marchand and others it was found that the Fätkörncellen were derived from the glia and not from leucocytes. It is probable that the lymphocytes do not migrate from the blood-vessels, but that they arise from the lymphatic channels. Neuronophagia was prominent in all the cases. In the acute stage the neurophages are polymorphonuclear leucocytes, later glial cells. Plasma-cells arise from lymphocytes and not from glia.

Häuptli finds himself in agreement with the older writers, Harbitz, Richter, and others, who gave an important rôle to polymorphonuclear leucocytes in the acute stage of inflammation of the nervous system. He cannot support Wickman, who derives the polymorphs of the later stage from lymphocytes, and likens them to the polyblasts of Maximow, but agrees with Wallgren, Homén, and others that they are of glial origin. He agrees with Wallgren that polymorphonuclear leucocytes are present in large numbers, but during the first few days only.

In encephalitis epidemica the findings were identical in every respect with those in poliomyelitis. The differential diagnosis cannot be made with certainty on the histological changes alone.

W. J. ADIE.

- [109] The histopathology and pathogenesis of amaurotic idiocy, with especial reference to cerebellar changes (Zur Histopathologie und Pathogenese der amaurotischen Idiotie mit besonderer Berücksichtigung der cerebellaren Veränderungen).—MAX BIELSCHOWSKY. *Jour. f. Psychol. u. Neurol.*, 1921, xxvi, 123.

BIELSCHOWSKY'S admirable paper deserves full consideration by all who are interested in or working at the subject. It concerns three cases of the disease in a Gentile family (N.B., not Jewish), occurring in each of their three children, beginning at the age of four in them all, and leading to profound idiocy and marasmus after a course of some three and a half



years. Its place, therefore, is intermediate between the infantile and the juvenile varieties: it is designated by Bielschowsky 'late infantile'.

The weight of the brains was 760 gm., 670 gm., and 685 gm. respectively—some 250 gm. below the normal weight for the age. Covered by a fibrous leptomeningitis, the brains were normally convoluted, but there was a tendency for the superficial cortical layers to split off from the deeper, especially in the calcarine area. The cortex was universally reduced, again especially in the occipital region. White matter was distinctly below the normal proportion. In all three the cerebellum was notably atrophic, not merely absolutely, but also in proportion to the already reduced size of the cerebrum, and this atrophy implicated both vermis and lateral lobes. No evidence of inflammatory processes was found in the meninges.

Throughout the whole of the nervous system the nerve-cells showed the characteristic swelling of the cytoplasm, with granular degeneration; the denarites, on the other hand, were much less involved than in the pure infantile variety, in comparison with which, further, the cell-degeneration was more restricted in degree to the cells of the cortex. In the basal ganglia, mid-brain, pons, medulla, and cord, many more or less normal cells existed alongside degenerated ones. Bielschowsky shows that the granular change in the cytoplasm is not derived from the breaking up of Nissl bodies. It is common to find a plasmatie network in the cell protoplasm, enclosing the degenerated granules, and distinct from the cell fibrillae.

The occipital cortex was the seat of a spongy disintegration, especially in the calcarine area, largely restricted to the lamina pyramidalis. Yet the myelo- and cyto-architectonic structure of the calcarine cortex was not otherwise grossly altered. Glial changes were prominent throughout the brain. The reduction of the white matter was presumably in part a hypoplasia and in part a degeneration. Striking changes were seen in the retina—loss of rods and cones and of the outer granular layer, glial degeneration, pigment deposits, etc. Yet the optic nerves were but slightly atrophic.

In the cerebellum the chief alteration was one of sclerosis; i.e., there was an immense overgrowth throughout the organ of fibrous glia. The granules of the granular layer had vanished. The Purkinje cells were largely present, but nearly all were degenerated. Many astrocytes were to be seen in the molecular layer: in it and in the layer of Purkinje cells no trace of nerve-fibres remained. Afferent and association fibre-systems alike, in the cerebellum, were conspicuously defective. Bielschowsky considers that the changes in the Purkinje cells were not those of the ordinary cell degeneration in amaurotic idioey, but rather akin to what is found in multiple sclerosis, juvenile general paralysis, etc. All the cerebellar nuclei were atrophic. Degeneration in the peduncles and in the olivo-cerebellar tracts suggests an analogy with the form of cerebellar atrophy known as olivo-ponto-cerebellar (Dejerine and Thomas); but on the whole the author is inclined to regard the cerebellar alterations as the result of the general morbid process acting on that organ.

The discussion of the significance of his material and the correlation with analogous cases from the literature are particularly informative.

S. A. K. W.

- [110] **Sensory disturbances from lesions in the oblongata and the pons.**—C. BERGMARK. *Upsala Läk. Forhandl.*, 1921, xxvi. Häft 5-6, contrib. no. 4.

A FINE paper, based on minute examination, clinical and pathological, of three cases: one of tumour at the level of the foramen magnum, one of occlusion of the posterior inferior cerebellar artery, and one of tumour of the medulla oblongata. The original should be consulted for many details which cannot here be referred to.

1. *Disturbances of sensibility in the trigeminal area on the side of the lesion.*—Much evidence from cases of thrombosis of the posterior inferior artery shows that touch cannot be conveyed solely by the descending root of the fifth and that it must have a localization on the central side of the Gasserian ganglion different from that of the other cutaneous senses. The author's finding is that it is partly localized within the descending root of the fifth, and partly (possibly following the motor fifth fibres) in the sensory nucleus of the nerve in the pons.

2. *Dissociated disturbances of the senses of pain, cold, and heat in the crossed half of the body.*—The author's evidence is against the somewhat dogmatic conclusions of Marburg, that in the conduction of pain and temperature impulses by the spinothalamic and spinothalamic tracts pain is mesially situated, heat laterally, and cold between the two. He can only say that "the sense of pain is situated relatively mesially more often than the other qualities". He further emphasizes the somewhat important point that in not a few cases the disturbance of sensibility is of the same type in the uncrossed half of the face and the crossed half of the body, which suggests the desirability of caution in drawing conclusions as to the topography of the different tracts for the cutaneous senses.

3. *Localization and the so-called space sense.*—Evidence is adduced which tends to show that localization of stimuli is effected not only by the dorsal column of the cord, but also by the lateral column on the opposite side. The topognostic sense (*Ortsinn*) is mediated, apparently largely though possibly not entirely, by the dorsal columns.

4. *The muscular sense.*—This sense has at its disposal two tracts, which can replace each other functionally. One is represented by the dorsal column of the cord, *fibræ arcuatae internæ*, and *lemniscus*. The other runs in the spinocerebellar tract of *Flechsig* and is still uncrossed when it reaches the cerebellar hemisphere, but then crosses to the other side and reaches the brain stem through one of the large cerebellar commissures of the crossed side. Under ordinary conditions the impulses of the muscular sense are probably transmitted mainly in the dorsal column system.

S. A. K. W.

- [111] **The pathology of functional nervous disease.**—KENNETH FRY. *Med. Jour. of Australia*, 1921, viii. 325.

THE author starts out on an endeavour to explain the processes of functional nervous disease on a basis of physiology. After referring to the current views with regard to such diseases, he recapitulates Sherrington's conclusions as enunciated in his "Integrative Action of the Nervous

System" and elsewhere. He then attempts to show how the laws laid down by this author operate on the 'emotional' level. Here it would have been better if the author had been clearer in the definition of terms which he uses: the word 'emotion', e.g., is used in so many different senses that it is difficult for the reader to realize what exactly is meant. Finally the author refers to the various methods of therapy in relation to this point of view.

The paper certainly merits attention as suggesting an important line of investigation, but it is impossible to abstract a short communication dealing with such a large subject, for it is bound to be reduced to the full limits of abstraction already. The general impression given is that the author has somewhat wearied of well doing, and the article does not quite fulfil the high expectations which are aroused in the first paragraphs.

R. G. GORDON.

[112] **The mechanism of referred pain, hyperalgesia (causalgia), and of alcoholic injections for the relief of neuralgia.**—JOSEPH BYRNE. *Jour. of Nerv. and Ment. Dis.*, 1921, liii, 433.

FUNCTIONAL or anatomical interruption of the afferent system of pathways, and more especially of those in the peripheral nerves, is associated with more or less persistent pain and tenderness which are referred to the area of distribution of the injured pathways. This pain is to be distinguished from reflected pain due to lesions of visceral organs, with which this paper does not deal. From periphery to brain two separate systems of afferent paths serve the purposes of sensation—the affective and the critical: but in testing sensory function there are four sets of afferent pathways to be kept in mind—superficial critical, superficial affective, deep critical, and deep affective.

The thalamus is concerned with affective perception and the cerebral cortex with critical perception, but the latter influences and controls the former at the level of the thalamus. Lesions at various levels illustrate the function of these systems. Injury to a nerve trunk, e.g., by compression, does two things—(1) more or less completely interrupts the function of the critical system, thereby abolishing its control over the affective system; (2) partially interrupts function of the affective system, thereby stimulating it to increased metabolic activity in the interests of functional restoration and repair. At first the energy is directed to repair, but if this is impossible the hypermetabolism gives rise to accumulation of energy which, no longer concerning itself with the more primitive embryonic function of growth and repair, becomes diverted to the more highly specialized function of preparing the materials necessary for the elaboration and discharge of nerve impulses. This results in the spontaneous or readily elicited discharge brainwards of impulses which are the immediate cause of pathological pain and tenderness. A useful diagram is given showing possible lesions on the sensory paths and the effects on the two systems. A description is given of the ordinary changes which take place in the myelinated and unmyelinated fibres after section of a sensory nerve.

After discussing the various forms of referred pains with illustrative

eases, and the relative influence of the affective and critical systems, the author concludes that: (1) All pain, whatever be the cause, is in reality referred pain. (2) The great causative factors in referred pain are (a) mechanical trauma such as contusion, over-stretching, compression; and (b) infection, the mechanism essentially consisting of the resulting hyper-functioning of the related affective neurones as set forth in the text. (3) The incubation period, during which pain and tenderness are absent for some time following severe injuries of nerve trunks, is the result of axonal reaction in the related neurone bodies of the spinal ganglia, with consequent cessation of specific function. (4) Alcoholic and other injections into the nerve-trunks for the relief of neuralgic pains act by inducing axonal reaction phenomena and suspension of specific function in the related affective neurone bodies in the spinal ganglia. (5) In all operative procedures, crushing, stretching, or otherwise injuring portions of nerves that are to remain connected with the spinal cord should be scrupulously avoided, as these are great factors in the causation of interstitial neuritis, neuromata, and other conditions well known to be vital sources of referred pain. (6) In assessing the value of etiological factors, with a view to therapy in neuralgia and neuritis, due weight must be attached to occupational and postural trauma of the nerves, muscles, tendons, and ligaments, as well as to exposure and faulty function from whatever cause. (7) In the investigation of painful conditions the afferent pathways from the periphery to the thalamus must be kept in mind and not merely the locus of the pain and tenderness. It is only in this way that the location and *modus operandi* of the causative factors can be appreciated and effectively attacked.

R. G. GORDON.

[113] Some observations on cistern punctures.—HENRY McCUSKER.  
*Jour. of Nerv. and Ment. Dis.*, 1921, liii, 153.

THE author describes the puncture of the cisterna magna on 55 occasions in 9 patients, of whom 6 were cases of neurosyphilis, 1 spinal tumour, 1 lumbosacral meningitis, 1 of undiagnosed head symptoms. The head and neck of the patient are shaved from the occipital protuberance to the 6th cervical vertebra and prepared as for other operations. The patient is placed on the operating table lying directly on his left side; the head is flexed on the chest and placed on a pillow so as to bring the occipital protuberance on the same horizontal plane as the vertebral spines. By palpation the depression between the occipital protuberance and the spine of the axis is located, and this area is well cocainized. The outer skin is punctured by a sharp lumbar-puncture needle, which is then discarded, and another of 18 gauge and graduated in centimetres is introduced. The direction of the needle is slightly forward, and along a plane passing through the glabella and upper edge of the external auditory meatus. At a depth of 4 to 5 cm. it will have pierced the dura and the posterior occipito-atlantoid ligament and entered the cistern. The needle is never introduced more than 5 cm. for fear of injuring the medulla. After withdrawal, pressure should be maintained over the puncture for some minutes and a sterile dressing be applied.



In the 55 punctures the author claims there was no evidence of injury to the medulla, no deaths, and no blood in the spinal fluid. The nuchal area was less sensitive than the lumbar area, and there was no sudden extension of the head. There was a consistent absence of pain on piercing the dura. There was no puncture headache, serum reaction, or backache, and no root pains or medullary symptoms, such as slowing of the pulse or respiratory changes. The punctures were made without difficulty, and with less discomfort to the patient than is generally found after lumbar puncture.

R. G. GORDON.

- [114] **Changes of Golgi's apparatus in nerve cells of the spinal cord following exposure to cold.**—C. DA FANO. *Jour. of Nerv. and Ment. Dis.*, 1921, liii, 353.

THE author has performed experiments on rats exposed to varying degrees of cold, using his own method of staining to demonstrate Golgi's apparatus. The relatively protracted exposure of small animals to a moderate degree of cold is sufficient to cause peculiar changes of Golgi's internal apparatus in the nerve-cells of the dorsal horns, intermediolateral and middle cell column, and grey matter surrounding the central canal. Such changes are characterized by an unusually robust aspect of the whole apparatus and of its constituent parts, which show a tendency to occupy a tight perinuclear situation. In more affected specimens the apparatus gradually loses its characteristic structure, and becomes transformed into irregular and variously-arranged masses and pieces. These alterations are accompanied by an appearance of canaliculi and spaces similar to those generally spoken of as Holmgren's trophosphonium. If the exposure to cold has ultimately been such as to lower considerably the normal temperature of the animals experimented upon, the same apparatus undergoes a further form of almost complete disintegration.

R. G. GORDON.

- [115] **Syphilis of the nervous system in children.**—EDWARD LIVINGSTONE HUNT. *Amer. Jour. Syph.*, 1921, v, 259.

THIS paper is in the form of a clinical lecture dealing with nervous and mental disease due to congenital syphilis. The author points out that in such children the disease attacks the brain more often than the spinal cord, whereas the reverse is probably the case in acquired syphilis. He considers diabetes insipidus to be a characteristic symptom of syphilitic involvement of the pituitary body. We do not altogether agree with the value he places on the Lange test in the cerebrospinal fluid. A curve such as 11110500000 would convey nothing to us except that one tube was dirty, and would certainly not be accepted as evidence of meningeal involvement; and we should like to know the type of curve obtained by the author in normal children and non-syphilitic epileptics before accepting changes in the colloidal gold of the order of 1, 1½, and 2 in a few tubes of the test as evidence of syphilitic irritation of the meninges.

J. G. GREENFIELD.



## ENDOCRINOLOGY.

- [116] Further experiences with the epinephrin hypersensitiveness test, with especial reference to 'diffuse adenomatosis' of the thyroid gland.—EMIL GOETSCH. *Endocrinology*, 1920, iv, 389.

It is well known that the symptoms of exophthalmic goitre, other than the ocular signs and gross thyroid enlargement, are frequently present in various morbid states, among which may especially be mentioned early tuberculosis, neurasthenia, and allied conditions. The object of the author is to determine in which of these conditions hyperthyroidism is present. For this purpose he makes use of the epinephrin hypersensitive test, which is positive in hyperthyroidism and always negative in its absence. The test is considered to be positive when, after injecting 0.5 c.c. of 1-1000 solution of adrenalin chloride (Parke, Davis & Co.), a rise of ten points occurs in the pulse-rate, or systolic pressure, or both, associated with various subjective changes which are not described.

The writer has collected fifteen cases, the main symptoms in which were mild tachycardia, asthenia, nervousness, sweating, and tremor. The metabolic rate was normal, whereas the test above described was positive in all. In all cases, resection of three-quarters of the thyroid substance was advised and performed. The after-histories are admittedly short, ranging from three to twelve months; all the patients except one were improved, some of them to quite a remarkable extent.

The anatomical changes in the thyroid are peculiar. The gland is moderately enlarged without, however, containing actual nodules, and is in many cases adherent to the perithyroid structures. The alveolar epithelial cells are not increased as in exophthalmic goitre, but are reduced in size and quantity, the glandular acini being small and irregular in shape. The interstitial cells, on the other hand, originating from the fetal cells of Wölfler, are increased throughout; these cells are large, with clear protoplasm and a round vesicular nucleus. This increase is diffuse and not focal, and no adenomata are present, but accumulations of lymphoid cells are a prominent feature. The vascularity of the gland is not obviously increased.

To this condition the name 'diffuse adenomatosis' is applied by the author, who regards it as a definite pathological entity, hitherto overlooked, and characterized clinically by a mild but chronic hyperthyroidism.

J. L. BIRLEY.

- [117] The effects of inanition upon the adrenal bodies.—SWALE VINCENT and HOLLENBERG. *Endocrinology*, 1920, iv, 408.

This is a preliminary communication arising out of McCarrison's important discovery that in pigeons inanition is associated with a remarkable enlargement of the adrenals. The authors carried out experiments on pigeons, rats, and dogs, and confirmed the existence of adrenal hypertrophy after varying periods of inanition. The question whether the hypertrophy is one of cortex or of medulla, or of both, remains unsettled.

J. L. BIRLEY.

## SENSORIMOTOR NEUROLOGY.

- [118] The early diagnosis of general paralysis and of tabes (Le diagnostic précoce dans la paralysie générale et du tabes).—GONZALO R. LAFORA. *Revue neurol.*, 1920, xxxvi, t191.

THE author remarks that insufficient trial has been given to arsenical medication, intravenous and intrathecal, in the *early* stages of G. P. I., most of the reports hitherto published having emanated from asylums. In order to test the efficacy of such treatment before 'extensive destruction of the brain substance has occurred, it is necessary to diagnose the disease in what he calls the pre-clinical stage.

He records the case of an acquaintance of his own, a man of academic distinction and considerable intellectual powers, in whom he noticed a slight inequality of the pupils. A history was obtained of syphilitic infection twenty-two years previously. The subject reported himself as being in normal health, but examination revealed fixed and unequal pupils. No other abnormalities were detected either in the mental or physical status. Laboratory tests shewed that the Wassermann reaction was weakly positive in the blood, positive in the cerebrospinal fluid. The cerebrospinal fluid also contained 22 cells per cubic millimetre, and gave positive globulin tests, with a definitely parietic colloidal-gold curve.

This case (which the author claims is unique in modern literature!) shows that even years before the earliest mental symptoms, examination of the cerebrospinal fluid may reveal signs characteristic of G. P. I.

In the early stages of tabes, on the other hand, the examination of the cerebrospinal fluid is not so constantly of diagnostic value. A case is quoted in which the clinical signs of the disease were present with negative Wassermann reactions in blood and fluid: the latter, however, showed 'a lymphocytosis', without increase of globulin. Finally, two cases are described as 'tabes in the initial stage,' with negative results from examination of blood and cerebrospinal fluid. The clinical evidence in support of the diagnosis fails to convince the reader of its accuracy in these two cases. The author's southern temperament enables him to write easily of a 'rapid and complete cure' of tabes if diagnosed in the early stages.

C. P. SYMONDS.

- [119] On the course of general paralysis (Ueber den Ablauf der Paralyse).—F. MEGGENDORFER. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1921, lxiii, 9.

THIS is an excellent statistical study of 1000 cases of general paralysis, with special reference to some of the many factors which have been thought to have an influence on the course of the disease. By avoiding the use of figures it is possible to give a concise account of the author's main conclusions.

*Age.*—The age of the patient at the time of infection has no influence on the form of syphilis which may develop in later life. The older the patient at infection, the shorter the latent period. This shortening is relatively greater than the diminished prospect of life in the higher age

groups. The age at infection or onset has no influence on the duration of the disease. The expansive form is commonest when infection occurs before 30, the melancholic form is commonest in late infection, the incidence of the simple demented form is equal for all ages. The latent period varies considerably within each age group. This suggests that some of the following factors may be active :—

*Sex.*—The latent period is slightly shorter in women than in men both for tabes and paresis, and both run a slower course in women.

*Alcohol.*—In alcoholics the latent period is longer than in abstainers, and the duration is considerably increased. (Average duration in alcoholics 20 months, in abstainers 10 months.)

*Treatment.*—The cases of uncomplicated general paralysis in which accurate information could be gained on this important point numbered 393. The latent period in those who had no treatment was 14·6 years; inadequate treatment, 13·8 years; good treatment, 12·9 years. From this it would seem that treatment hastens the onset of paresis. But on analysing the age groups it is clear that this conclusion is fallacious. Most of the cases of inadequate or no treatment are found in the younger groups, where the latent period, as we have seen above, is long, whilst those who acquire syphilis later in life undergo more thorough treatment. Hence it comes about that if statistics are compiled without reference to the age of the patients at the time of infection, it appears as if treatment shortens the latent period. In reality early treatment has no effect thereon. In 20 cases where salvarsan had been used in the early treatment the latent period was unusually short, but no conclusion should be drawn from this, because the cases with longer latency have not yet had time to appear. The duration of the disease is shorter in those who have had good early treatment. Once the disease is established, treatment by fever therapy and by antisypilitic remedies prolongs the disease, and remissions are more frequent than in untreated cases.

*Occupation.*—This has no influence on the latent period. The duration is slightly shorter in brain workers than in manual workers.

*Fatigue and exposure.*—In soldiers who served in the great war the latent period was shortened on an average by two and a half years. It might be said that the diagnosis would be made earlier in the field than under peace conditions; but this would not account for such a big difference, a period which equals the total duration of the disease in many cases. A more important consideration is that the figures must necessarily refer to cases with a short latent period, for those with a longer incubation have not yet developed the disease. At present it is not possible to state with certainty that the onset of general paralysis was hastened by military service. The duration is the same in soldiers as in others.

*Trauma.*—This has no influence on latency or duration.

Other factors which from these figures seem to have no effect on the course of the disease are: habitus, anomalies of internal secretion, the presence of stigmata of degeneration, and intercurrent diseases.

W. J. ADIE.

- [120] **Conjugal syphilis of the nervous system.**—ALFRED GORDON.  
*Amer. Jour. Syph.*, 1921, v, 248.

THIS interesting paper describes thirty-two cases of conjugal or cohabitation syphilis of the nervous system, observed during a period of eight years. They were derived from twelve sources. In one instance a man, his two mistresses, and his innocent sister all developed neurological signs of syphilis. It is interesting to note that in some cases a different form of nervous disease appeared in each of two or three patients of a group infected from the same source or from one another, one developing tabes, another paresis, and a third syphilitic meningitis. So many cases of conjugal tabes and conjugal paresis have been reported that we are glad of a corrective to the idea that this is the rule rather than the exception. In fact, such cases, by their rarity, seem to be evidence against, rather than for, the existence of a neurotropic strain of the *Spirochata pallida*.

J. G. GREENFIELD.

- [121] **Studies in heredo-ataxia.**—EMANUEL BERGMAN. *Upsala Läk. Forhandl.*, 1921, xxvi, Häft 5-6, contrib. no. 3.

IN this clinical paper two families of Friedreich's disease and one of so-called hereditary cerebellar ataxia are described. In the first there are six cases of Friedreich's disease among fifteen brothers and sisters; the second has two branches, with five cases among ten brothers and sisters in the one, and one out of six in the other. The third family is one with four cases of hereditary cerebellar ataxia in four generations.

The author is compelled to admit the difficulty of recognizing the latter disease as a well-marked clinical and pathological entity, and is inclined to look on both as different expressions of one and the same condition, viz., 'hereditary ataxia'. He is unable to help us by definite contribution to the problems of etiology connected with these two affections, but concludes tentatively that in hereditary cerebellar ataxia inheritance is dominant, and in Friedreich's disease recessive.

In the former family the disease began at four years of age in the representative of the youngest generation, in her father at forty, and in her grandfather at fifty-six. The symptoms were gross ataxia, little spasticity, occasional tremor, dysarthria, pallor of discs, no nystagmus, brisk knee-jerks, Achilles-jerk absent on one side and reduced on the other, double extensor response. Bergman observes with truth that the only way to fight these diseases actively is by trying to prevent them, and recommends more intensive study of the variations of the diseases in different families, with a consciousness of the end in view: perhaps the time will come "when by means of eugenics we can seek to prevent as far as possible the origin and inheritance of these diseases".

S. A. K. W.

- [122] **Family spastic paraplegia (La paraplégie spasmodique familiale).**  
—P. VAN GEHUCHTEN. *Revue neurol.*, 1920, xxxvi, 901.

THE writer opens with a brief review of the literature and the attempts made at classification of the various combinations of spastic paraplegia of

familial type with other symptoms. He concludes that we may consider as a separate type a group of cases in which the symptoms are confined to those of a paraplegia usually limited to the lower limbs, in which pathological changes are found in the spinal cord only and are chiefly manifest in the pyramidal tracts. He proceeds to describe in detail a familial group of these cases.

The case first investigated was that of a soldier, age 35, with a five years' history of slowly-developing weakness and spasticity of the lower limbs, without sensory changes or sphincter involvement. Clinical examination revealed the signs of a bilateral lesion of the pyramidal tracts. It was subsequently discovered that, of the patient's four brothers and sisters, three presented signs and symptoms of a similar character, these in each case having appeared at about the age of 30. The mother of these patients, 64 years of age at the time of examination, proved to be completely paralysed, the symptoms in her case having begun at the age of 35. Of her three brothers and sisters, two had been affected presumably with the same complaint, and one of the sisters had a son also attacked by the same malady at the age of 30.

The author concludes with some remarks upon the diagnosis of the disease, the pathological findings reported in cases which have been verified post mortem, and the obscure question of etiology. References are given to papers by Lonain (Paris, 1898) and Rhein (New York, 1916), which are said to contain full bibliographies.

C. P. SYMONDS.

- [123] **Familial infantile spastic spinal paralysis** (Ein Beitrag zur Frage der familiären infantilen spastischen Spinalparalyse).—GRÜNEWALD.  
*Jour. f. Psychol. u. Neurol.*, 1920, xxvi, 111.

A CLINICAL description of two cases (brothers) in a family in which apparently some nine male members were affected in five generations. The disease began in each without extraneous factor, at the same age, and with the same symptoms: it followed an identical chronic progressive course, and had appeared in apparently identical form in the elder generations also. The paper is accompanied by a very useful précis of some seventy-nine cases from the literature since 1890, derived from a review of nineteen original communications, but it omits all reference to valuable papers by Ernest Jones and other English writers.

S. A. K. W.

- [124] **A case of spinal tumour in the upper cervical region** (Ein Fall von Rückenmarkstumor im oberen Cervikalbereich).—A. MÜLLER.  
*Deut. Zeits. f. Nervenhe.*, 1920, lxxi, 183.

A WOMAN, age 62, in excellent health, suddenly lost the use of the right arm and leg, with unimpaired consciousness and no speech defect. Power returned gradually, and in six months she was performing her household duties. Three months later, again quite suddenly, she lost power in both legs, and in a few weeks the arms were also paralysed.

*On admission.*—Complete quadriplegia, hypertonia extreme in legs, slight in arms, muscles of shoulder girdle and intrinsic hand muscles wasted,



all deep reflexes increased equally, abdominals absent, plantars extensor, no fibrillation, sphincters intact, no subjective or objective sensory troubles, Wassermann negative in blood and fluid. Pandy + + + +, cells not increased.

*Clinical diagnosis.*—Probably atypical amyotrophic lateral sclerosis.

*Post mortem.*—Endothelioma size of a cherry on inner surface of dura 6 cm. below medulla on anterior aspect of cord, cord quite flat, no other lesion in nervous system.

*Special points.*—Complete absence of pain throughout course of disease, sudden onset, and early remission.

W. J. ADIE.

[125] **Tumour of the third ventricle with compression of the hypophysis and without infundibular syndrome** (Tumeur du troisième ventricule avec compression de l'hypophyse et sans syndrome infundibulaire).—H. CLAUDE and H. SCHAEFFER. *Revue neurol.*, 1921, xxxvii, 25.

THE authors recount the structures likely to suffer from compression in cases of distention of the third ventricle, and among the resulting symptoms draw particular attention to those which are associated with lesions of the tuber cinereum and infundibulum. In a paper by Claude and Lhermitte in 1917, a case was described in which a tumour strictly limited to the cavity of the third ventricle gave rise to what the authors named the 'infundibular syndrome'. This consisted of attacks of narcolepsy, cardiac irregularities, polyuria, and polydipsia. The hypophysis in this case was normal, and its possible rôle in the production of these symptoms was therefore excluded.

In the case here described the hypophysis showed marked changes, while the infundibular syndrome was absent. The patient, a man, age 29, came under observation in May, 1920, and died six days later following a right-sided operation for decompression. The symptoms, which were of about one year's duration, consisted in the first place of weariness and lassitude, together with changes in the temperament. To these were shortly added complete sexual impotence. In the course of five months the patient put on ten kilo. in weight. For five months he had suffered from severe headaches, accompanied by vomiting, and transient mistiness of vision. On examination, he was drowsy and suffering from severe headache. Slight nystagmus on lateral deviation, and bilateral papilloedema, were the only other signs of nervous disease. In spite of the gain in weight already mentioned, there was no marked adiposity, nor were the genital organs atrophied. Lumbar puncture was twice performed. Following the second occasion the patient became comatose, with unequal fixed pupils, and some rigidity of the left limbs. Cheyne-Stokes' respiration developed, and the patient died twenty-four hours after a right-sided decompression operation.

At the post-mortem a closed cyst the size of a pigeon's egg was found within the distended third ventricle. The lateral ventricles and foramina of Monro were much dilated, while the aqueduct of Sylvius was reduced

to a linear slit. On either side the walls of the cyst were attached to those of the third ventricle, whilst at its anterior end it was prolonged in the form of a diverticulum which ended in a solid nodule of growth occupying the pituitary fossa. The pituitary body was much damaged, the posterior lobe having been practically obliterated by pressure, while the structure of the anterior lobe, though still recognizable, contained few normal cells. Microscopical examination showed the growth to be of an epithelial nature, consisting of columnar cells in the periphery of the nodule, with colloid degeneration in the centre. The walls of the cyst consisted of a layer of delicate connective tissue, containing in its meshes cells similar to those already described. At the points of the attachment on either side to the walls of the ventricle, the surface of the optic thalamus was covered with a layer of epithelial cells of similar type, beneath which there was proliferation of glial elements, while the superficially situated nerve-cells showed degenerative changes.

Further examination of the brain and spinal cord showed no changes which the authors considered to be of significance. They comment upon certain points of peculiar interest in the case:—

On lumbar puncture the cerebrospinal fluid appeared to be under no excessive pressure. This was due to the blocking by compression of the aqueduct of Sylvius. The dilatation of the right pupil and left hemiplegic rigidity are put down to compression of the right side of the mid-brain.

The early symptoms were those of disturbed pituitary function only. This is in accordance with the fact that the grey matter around the third ventricle was compressed but *not invaded* by the neoplastic formation.

The order of development of the symptoms and the mode of their production is best explained by the assumption that the tumour developed in the first instance from a remnant of the pharyngeohypophyseal diverticulum. They remain somewhat uncertain, however, as to this point, admitting the possibility of its origin in the ependymal cells of the ventricular wall.

C. P. SYMONDS.

[126] L'Epilepsie traumatique.—P. BEHAGUE. *Congrès des Médecins Aliénistes et Neurologistes, Luxembourg-Metz*, 1921, Aug. 1-6.

This paper is a review of observations of epilepsy resulting from cranial wounds during the war. The author may perhaps antagonize most English neurologists, who follow the teaching of Hughlings Jackson, by talking about scars resulting in constant irritation of the brain and so producing fits.

In the first part he classifies cranial wounds into perforating and non-perforating, and except for noting the fact that while perforating wounds are more likely to cause fits than non-perforating ones, and that all cranial wounds may be followed by epilepsy, he comes to no definite conclusions. He distinguishes between the transitory fits due to commotion and infection and those which persist for long periods. He gives certain statistical results of inquiry into etiology which are quite inconclusive.

In the second part he considers the causes of the period of latency between the wound and the first fit. These, he considers, depend on the duration of the process of cicatrization of the cerebral wound and on the site of the wound; but as a general rule, if no fits have occurred eighteen months after a wound, none are likely to occur.

In the third part he describes with Gallic thoroughness the varieties of prodromata, auræ, crises, and post-paroxysmal manifestations. He points out with justice the extreme difficulties under which an epileptic labours in the labour market, and lays stress on the difficulties of just assessment for pensions purposes.

In the fourth part he discusses treatment. Under medical measures are discussed bromides, which he thinks should be given in the form of the purified sodium salt; borates, which are of doubtful value and seem to be more useful in commotional cases than in others; and urea derivatives such as veronal, luminal, and dial. Combinations of these may also be given, but on the whole the author favours luminal. In dealing with surgical procedure, he advocates this when there are signs of an obvious foreign body or collection of pus or blood. He very properly reminds his hearers that epilepsy is caused by scarring of the cortex, and therefore any procedure which destroys more of the cortical tissue is harmful. He lays it down that exploratory surgery of the cranium is absolutely unjustifiable, and opening the cranium, and still more the opening of the meninges, should only be done when there is a very definite indication for doing so. It is a pity that all surgeons do not take this to heart; it is evident that those who still advocate surgical interference in epilepsy except in very special cases do not have the courage or wisdom to follow up their cases after operation for two or three years, or they would soon change their opinions.

It is very striking that, from beginning to end of a paper on fits resulting from the war, no mention is made of hysterical epilepsy. Anyone who has had much experience of these cases, and has applied the therapeutic test, knows how many of these cases are wholly or partially functional and amenable to treatment by some form of psychotherapy.

R. G. GORDON.

[127] **Relation of increased blood viscosity to transient attacks of hemiplegia.**—W. H. HOLMES, *Jour. Amer. Med. Assoc.* 1921, lxxvi. 1640.

By transient hemiplegia the author means those cases which are due to a temporary deficiency in the blood-supply of certain areas of the brain that is of insufficient duration to cause permanent damage. He points out that the theory of local arteriospasm often advanced to explain such attacks does not and cannot rest on any proofs, and suggests that physical changes in the blood are just as likely to be responsible as local changes in the arteries. The viscosity of a fluid is one of the factors influencing the rate of its flow through a tube. The viscosity of the blood alters with increase of concentration of cells, colloids, or  $\text{CO}_2$ , but in health this is not sufficient to produce symptoms. Extreme dehydration of the tissues resulting from

excessive sweating, diarrhoea, etc., will raise the viscosity 25 to 30 per cent. and in conditions of actual or relative hypotension or general vascular disease this may slow down the cerebral circulation sufficiently to produce symptoms.

He concludes that in the care of patients of advanced years or those known to have vascular disease, and in those who have had cerebral vascular crises, dehydration of the tissues or too great restriction of intake of fluids should be avoided. The introduction of anticoagulant salts and of fluid may be indicated in certain cases of transient hemiplegia or aphasia, in order to prevent actual thrombosis in vessels when slowing of the circulation is the cause of the symptoms.

R. G. GORDON.

- [128] Meningitis serosa chronica as a residual or late symptom in epidemic encephalitis (Meningitis serosa chronica als Rest- oder Späterscheinung bei Encephalitis epidemica).—F. HARTMANN. *Deut. Zeits. f. Nervenhe.*, 1920, lxxi, 134.

THE author gives an interesting account of changes in the pressure of the cerebrospinal fluid at different stages in four cases of this disease. A considerable rise in pressure from sixteen to twenty-two weeks after the disappearance of acute symptoms coincided with an increase in the severity of the residual symptoms. Once the rise occurred, the pressures ranged between 200 and 400 mm.—averaging about 300 mm. as long as the cases remained under observation. Hartmann concludes that the late symptoms—headache, torpor, general weakness, slow cerebration, pains in the limbs, restlessness, and so on—are caused in part at least by meningitis serosa, and suggests that as repeated punctures produce no permanent lowering of the pressures, some method of permanent ventricular drainage might be tried.

W. J. ADIE.

- [129] Subjective signs in diagnosis.—T. A. WILLIAMS. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 185.

THE author pleads for a return to the consideration of subjective symptoms. He admits that the patient's interpretation of these is quite valueless, but points out that the medical profession have not been guiltless of erroneous interpretation. If subjective symptoms are neglected, the objective findings are apt to lose all proportion one to another, so that fads and prejudices arise. The diagnosis of the psychoneuroses must depend entirely on subjective symptoms; but the physician must not neglect objective signs in these cases by being too impressed by the mental subjective symptoms. The author points out the value of the subjective symptom of numbness and other paræsthesias as the first sign of sclerotic changes in the central nervous system in such conditions as pernicious anaemia, thalamic lesions, and arteriosclerosis. The reliability of the patient must, of course, be estimated in evaluating subjective symptoms; but it is unnecessary to mention the importance of muscular hyperalgesia in diseases of the viscera, nor must headache and vertigo ever be neglected in diagnosis.

The paper is a wholesome reminder that the patient is a part of the disease, in an age which is too prone to depend exclusively on the laboratory.

R. G. GORDON.

### TREATMENT.

- [130] Non-operative treatment of fractures of cervical vertebræ with cord injury.—MICHAEL OSNATO. *Jour. Amer. Med. Assoc.*, 1921, lxxvi, 1737.

THE author points out the difficulty in deciding whether to operate or not in cases of injury of the cervical spine. He quotes Elsberg, who condemns operation in cases which show complete loss of sensation, motor power, and reflex activity below the lesion, but who advocates it in cases when all activity is not lost at first, but with progressive loss within the first few days after injury, especially if compression of the cord by fractured vertebræ or extravasated blood can be demonstrated. The danger of operation on the cervical cord is affection of the vagus and phrenic nerves by the œdema induced, with resultant respiratory and cardiac paralysis. Three out of the author's four cases recovered without operation, whereas Elsberg's figures for those not operated upon was 70 per cent of deaths. If the patient does survive, the functional recovery is surprisingly good compared with cases of injury in other parts of the cord. The most frequent residuals are paresis in the extremities, and atrophies in the small muscles of the hand, with stiffness in one or both lower limbs. There is little loss of sensation, and bladder and rectal control is usually re-established. The statistics of surgical interference are not encouraging even in partial lesions, but Elsberg believes that this should improve with greater experience and better technique; the author, on the other hand, thinks that great conservation should be observed, though in the later stages disabling root pains may demand interference. The cases of four patients are described in full; one of them died, but the other three made relatively good recoveries, all without operation.

R. G. GORDON.

- [131] Some accounts of the responsibility of intensive methods with regard to the incidence of early neurosyphilis.—A. REITH FRASER. *Amer. Jour. Syph.*, 1921, v, 201.

STARTING from the hypothesis that in every case of neurosyphilis the nervous system is invaded in the secondary stage, the author takes up the position that every patient with secondary syphilis should be regarded as harbouring spirochaetes in his intrathecal tissues. He considers that at this stage it is dangerous to push antisyphilitic treatment too energetically, as, if one is successful in eradicating the spirochaetes from the general body tissues, the blood will be deprived of antibodies and the spirochaetes in the intrathecal tissues will then have free rein to multiply and attack the nervous system. This theory rests on the hypothesis that antibody reaches the intrathecal tissues from the blood-stream, but no facts or experiments are adduced to prove this. As a corollary we get the unexpected statement



that "a spinal fluid showing a positive Wassermann reaction commands a much better prognostication than a fluid which has remained normal." Apparently also it is far safer for a patient threatened with neurosyphilis to have a positive than a negative Wassermann reaction in the blood. The author counsels a prolonged course of treatment so regulated as to keep the supply of antibody going 'indefinitely'. In a paper so full of apparent paradoxes as this we should have been glad of a little statistical information, but no doubt the author is reserving this for a later paper.

J. G. GREENFIELD.

## Psychopathology.

### PSYCHOLOGY.

- [132] A note on Hazlitt.—L. C. MARTIN. *Internat. Jour. of Psycho-analysis*, 1920, iv, 411.

It is interesting to know that Hazlitt wrote several works, in the years from 1820 to 1822, in which are found striking anticipations of some of Freud's theories. In his essay 'On Dreams' in *The Plain Speaker*, he writes: "We are not hypocrites in our sleep. The curb is taken from off our passions, and our imaginations wander at will. When awake, we check these rising thoughts, and fancy we have them not. In dreams, when we are off our guard, they return securely and unbidden". Hazlitt emphasizes the fact that man is far less a rational than an emotional animal. In his works are found a number of passages in which he lays stress on the existence in the human mind of motives or emotions which are 'hidden'. In 'Characteristics' he affirms that "The wish is 'often father to the thought', but we are as apt to believe what we dread as what we hope". (Freud has shown the close relationship between fear and desire.) The suggestion of a constant and dynamic though loosely woven theory of the unconscious is found in the extracts quoted from Hazlitt in this note.

C. W. FORSYTH.

- [133] Erotism as portrayed in literature.—F. J. FARNELL. *Internat. Jour. of Psycho-analysis*, 1920, iv, 396.

It can be demonstrated that, in verse or prose, no expression, however trilling it may appear on the surface, is unmotivated. The author's present and his past, his secret aspirations and his most intimate 'soulful' feelings, are bound to crop up in his writings, manifesting here his love, there his hatred, again a faulty adjustment, now a gratified wish. With a few facts about an author and his works before you it is possible to size up the man, to interpret much in his writings as indications of strength or manifestations of weakness in his personality. The weaknesses are usually undeveloped phases of his personality, and revert to the infantile.

Infantile perversions may become fixed at puberty, producing several abnormal types: the homosexual, the sadistic, the masochistic, and the narcissistic. Extracts from the writings of several authors are given, from which it is easy to deduce that they—consciously or unconsciously—belong to one or more of these types.

C. W. FORSYTH.

[134] *The dream in Russian literature.*—G. STRAGWELL. *Psycho-analytic Rev.*, 1921, viii, 225.

NOT only does the dream play a prominent position in Russian literature, but it is handled differently from that in any other literature. Because of the strict censorship exercised in Russia over all writing, symbolic writing became an art, and in this way the authors cleverly met the wishes of the censor, just as the unconscious in its dream activities disguises our thoughts so that they will be acceptable to our censor. Beliefs were thus conveyed which otherwise would not have been permitted. Protests against the government, the Church, and the army are thus found, and a strong revolutionary sentiment is often expressed behind the symbolism. Many writers handle the dream material consciously, presenting a wish fulfilment, and show a fair knowledge of the mechanisms involved. The above points are well illustrated by excerpts from the works of Dostoevsky, Korolenko, Gogol, Pushkin, Tchernyehewsky, Kuprin, Turgenev, and Chekhov.

C. STANFORD READ.

[135] *Psychology of one pantheist.*—THEODORE SCHROEDER. *Psycho-analytic Rev.*, 1921, viii, 314.

HEREIN is portrayed the personality of a man who claims Godhood, and his intellectualizations with regard to his self-apotheosis. The author discusses the psychology of such mentalities. In all pious literature it is asserted that the essential of spiritual regeneration is a conviction of sin, which in psychologic terms means a feeling of inferiority. In this individual this was grounded first in organic inferiority, and later in a feeling of 'moral' inferiority, which latter was based upon a criminal career lasting until his thirty-sixth year, when conversion took place. His conversion and idea of godhood only supplied new explanations and theories for the old conflict of impulses. His apotheosis is but a compensatory wish-fulfilling phantasy which neutralized his great feeling of inferiority. The whole performance looks like erotomania, whose persistent ecstacy is only a psychologic auto-erotism which may be the outlet for any form of repressed perversions of the sexual impulse. The greater the feeling of personal unworthiness grows, the greater the necessity to lose one's identity in an ever nearer approach to the aliveness of things, and to be absorbed into a crowd, or into God. This is a great emotional relief, in so far as it serves to help the elements of inferiority to be excluded from consciousness. We also achieve an identification with relative omnipotence, and thus hysterics satisfy both of their conflicting tendencies. Always we are diverting moral criticism from ourselves and diffusing it over the race so as to reduce our

feeling of relative guilt. To ascribe our sins to Adam and heredity relieves us, too, of blame. With much intensity in the inferiority feeling, simply being a superior moral critic is not adequate, and the tendency is to claim redemption from the fallen state of the race and thus approach perfectionism and even oneness with God. That is the impulse which predisposed many towards pantheism. By approaching the ultimate of a morbid shame, there may be made an unconscious identification with a supposed evil aspect of the universe, and with the growth of this inferiority feeling toward satanic proportions there may be an identification with superhuman evil, with the devil. Having thus created for ourselves and within ourselves a morbid evil spirit by means of which we identify ourselves with an infinite evil, so by the same necessity we create for ourselves and within ourselves a compensatory infinite beneficence, thus making ourselves one with God.

C. STANFORD READ.

### PSYCHOSES.

[136] The platelet-count and bleeding-time in catatonic dementia præcox.—SHICHI UYEMATSU. *Amer. Jour. Psychiat.*, 1921, i, 15.

THYROID secretion has long been known to have relation with blood-coagulation time, and Hauptman was the first investigator to show that catatonics presented a decidedly shortened coagulation, which he attributed to a diminished function of the thyroid. The author briefly discusses the theory of coagulation, and points out that the blood-platelets play herein an important part. In catatonics these platelets are exceedingly increased, and it is presumed that the shortened bleeding-time is due to this fact. In myxœdema and cretinism the same findings exist, but how the blood-platelets increase in these diseases is uncertain. The observations of Kraepelin, Lundborg, and Schmidt point to some etiological relationship between catatonic dementia præcox and hypothyroidism, while hematological and mental study tends to confirm it. With these similarities, can this psychosis be regarded as the result of hypofunction of the thyroid? Some facts oppose this assumption. Bleuler denied the relationship because of the ineffectiveness of thyroid treatment: Berkeley reported recoveries by partial thyroidectomy: and histopathological changes, found by various observers, showed the thyroid gland to be most often normal.

These facts indicate that myxœdema and catatonic dementia præcox cannot be explained simply by the diminished function of the thyroid. Is the disturbance of the thyroid in catatonics a dysfunction? To answer this question, the sensitiveness of the gland was tested in twelve cases by Harrower's method. Eight cases showed a normal reaction, one presented a typical figure of hypofunction, and three revealed a hyperfunction. Uyematsu thinks it reasonable to suppose that in catatonics we are not dealing with a simple hypofunction, but with a delicate functional disturbance which shows in many respects a similar picture to it. No idea is entertained as to the nature or origin of this, or whether it is secondary to a disturbance of other secretory glands. The fact that no other diseases of the nervous system show so marked a resemblance to thyroid hypo-

function as does the catatonic would probably favour an endocrinal origin. It is thought that thyroid therapy with some other form of treatment will perhaps permit a more favourable prognosis in this form of dementia præcox.

C. STANFORD READ.

- [137] Reaction in dementia præcox to the intravenous administration of non-specific protein. THEOPHILE RAPHAEL. *Amer. Jour. Psychiat.*, 1921, i, 31.

VERY contradictory results have been reported from the administration of such a non-bacterial protein as sodium muelcinat, so that the writer has made a special investigation of the effects of intravenous injection of typhoid vaccine, which has apparently come to be regarded as the agent of choice in general non-specific protein therapy. A series of seven male cases were studied, including well-marked representatives of the four primary types of dementia præcox. The cases were, in addition, so selected as to render possible a survey over patients in three successive stages in the progression of the disease. As a result, no amelioration in psychiatric status was effected, and the general constitutional reaction closely approximated that reported as characteristic of non-psychotic individuals. The only difference was that in the former there seems to have been, additionally, evidence of transient weight-loss, a preliminary leucocytosis period, a late leucopenic period, and a marked persistent reduction in the erythrocyte count, with a tendency for increased fragility change, all of which upon further study may be found typical of non-psychotic cases as well.

C. STANFORD READ.

- [138] Moral imbecility. A. F. TREDGOLD. *Proc. Roy. Soc. Med.*, 1921, xiv, 13.

THE writer holds that the higher mental qualities of wisdom and moral sense are not innate but are largely dependent upon training. 'Wisdom' is defined, and a short sketch is given of how it develops in the race and in the individual. The author's opinion of the psychological nature and evolution of moral sense is as follows: When primitive man had arrived at the stage of regulating his conduct through wisdom, that is, through the intellectual perception that it was wise to do so, the approbation following such restraint would favour the evolution of his self-respect, and there would gradually be developed a sentiment regarding such acts. Conduct in accordance with the customs of the community would come to be regarded not only as wise but as right; conduct opposed to those customs as not only unwise but wrong. Ideals of conduct would gradually be developed which would not only act as a restraint to primitive instincts, but would possess an actual impelling force of their own. Moral sense is thus based primarily on the desire for approbation, self-esteem, and the tender emotions. Similarly moral sense is developed in the individual. The new-born child has neither wisdom nor moral sense; he has, however, many deeply ingrained impulses to action, and in his early years these tend to be expressed in their original primitive way. In the normal child, as



the result of precept, example, admonition, and punishment, there is first gradually evolved the intellectual perception that misconduct does not pay. At a somewhat later stage the development of moral sense becomes super-added; the child acquires a sentiment of his relationship to society, of social obligation; and later, of still higher moral and social ideas.

Misconduct is probably due to a defect of the qualities wisdom and moral sense. Of these two, defect of wisdom seems the more important. An individual may be intelligent enough to acquire scholastic knowledge, but he may be lacking in any sense of the rightness or the wrongness of his conduct, and he may be incapable of forming a judgement as to their ultimate effects, and unable to co-ordinate his conduct to his ultimate advantage. Such defect is truly mental, and is, in the writer's opinion, the defect meant in the definition of a moral imbecile. Moral imbeciles are imately lacking in the potentiality for the development of the faculties wisdom and the moral sense, and this lack is permanent.

C. W. FORSYTH.

- [139] **Psychological traits of the Southern negro, with observations as to some of his psychoses.**—W. M. BEVIS. *Amer. Jour. Psychiat.*, 1921, i, 69.

(1) The Southern negro has certain psychological traits that are reflected in his psychoses. (2) Motion, rhythm, music, and excitement make up a large part of the life of the race. (3) They are care-free, and sadness and depression have little part in their psychological make-up. (4) Fears and superstitions stand out most prominently. (5) The number of cases of alcoholic psychoses is surprisingly low. (6) Suicide and suicidal tendencies are almost absent in coloured patients, the ratio being about one to three thousand in State hospitals. (7) The incidence of cerebrospinal syphilis and paresis is relatively low. (8) Manic-depressive psychoses have a high percentage. The manic phase is the one nearly always seen. (9) Dementia præcox stands at the head of the list of the psychoses of the coloured, the catatonic form occurring about twice as often as in the white, and the paranoid form coming next in importance. (10) Mechanistic classification of the psychoses of the race show that nearly all are dissociation, compensatory, or repression types.

C. STANFORD READ.

- [140] **Reaction in dementia præcox to vagotonic and sympathicotonic criteria.**—THEOPHILE RAPHAEL. *Amer. Jour. Insan.*, 1921, lxxvii, 543.

IN view of the significance recently accorded to vagotonic and sympathicotonic manifestations in endocrine and nervous-system disorders, it was deemed of interest to study a series of dementia præcox cases from this standpoint. Eleven cases, including simple hebephrenic and catatonic types, were examined. The positive criteria actually selected as most practicable were, in the case of vagotonia, exaggerated reaction to pilocarpine and positive response to the oculocardiac reflex. For sympathicotonia, the criteria chosen were the epinephrin, eserine, and oculocardiac



reactions. It was concluded that no evidence was secured indicative of vagotonic or sympathicotonic reaction in dementia præcox.

C. STANFORD READ.

- [141] A comparison of manic-depressive and dementia præcox cases by the free-association method.—GARDNER MURPHY. *Amer. Jour. Insan.*, 1921, lxxvii, 545.

THE cases intensively studied comprise 21 of manic-depressive depression, 12 of manic-depressive excitement, and 13 of dementia præcox. Four cases of general paresis were also studied, but these were too few to warrant any conclusions. In all cases the Kent-Rosanoff word-list was used. A study of these fifty pathological cases shows no great preponderance of any one type of association in any of the four psychotic groups, but the differences between psychotic groups are in some cases significant enough to suggest diagnostic usefulness. We might sum up as follows: (a) From the use of fifty-three stimulus words, the presence of eight or more non-adjective associations is against dementia præcox; (b) A difference of ten or more between the number of contiguities and the number of adjective-noun associations is against dementia præcox; (c) The presence of four or more individual reactions which are also contiguities is in favour of dementia præcox. If the question is simply one of deciding between the two psychoses considered here, (a) and (b) are of course in favour of manic-depressive psychosis. If the subject shows none of the three traits just named, or if he shows one in favour of each of the two psychoses, the method leaves him 'undetermined'. Otherwise, the method will make a decision in his case. Data accumulated since the completion of this paper tend on the whole to support the validity of criteria (a) and (b), but to cast very serious doubt on criterion (c). The work continues.

C. STANFORD READ.

- [142] Psycho-analytical observations on tic.—S. FERENCZI. *Internat. Jour. of Psycho-analysis*, 1921, ii, i.

THE writer holds that tics as well as stereotypies have their origin in narcissism. He sees in tics nothing but a stereotypy performed with a lightning rapidity and in an abbreviated way. The fact that a large number of paranoïacs and schizophrenies suffer from tic supports the contention that these psychoses and tic have the same root. In both tic and catatonias there is a tendency to stereotypies, grimacing movements, mannerisms, echolalia, and echopraxia. Further, the motility and affectivity of the tiqueur is governed, not as in the normal by the preconscious, but by undesired and partly unconscious (organ-erotic) instinctive forces, and that to a degree only known to occur in psychoses. The record of cases in Meige and Feindel's book on the tics (in which the subject is not treated from the psycho-analytic view-point) shows that these patients are of a mentally infantile character, narcissistically fixed, from which the healthy part of the personality can with difficulty free itself. They state that tiqueurs are often childlike, they feel themselves young, are given to self-observation, and are unable to govern their emotions. Many other

considerations are put forward which add further weight to the author's views.

In a series of ties or stereotypies, the secondary if not the chief function is to draw attention and feeling from time to time towards particular parts of the body. In some cases tie is the outcome of constitutional narcissism; in others, the 'pathoneurotic ties', it arises as a result of an injury of a part of the body already heavily charged with libido (an erotogenic zone). Ferenczi would add what he calls the 'ego-memory system' to Freud's scheme of the building up of the 'psychical systems'. To this system falls the task of continually registering the subject's own mental processes. It would have a stronger development in a constitutional narcissist than in people of completely developed object-love.

To explain the formation of tie, a conflict inside the ego (between the ego-nucleus and narcissism) and a process analogous to repression must be supposed. The writer traces back the origin of tie to an increase of narcissism in the following manner: "In the case of 'patho-neurotic tie', the injured or stimulated part of the body (or its psychic representative) is charged with excessive interest and libido. The quantity of energy required for this is drawn from the greatest libido reservoir, the genital sexuality, and this must of necessity be accompanied by a decrease of potency in the normal genital sensations. This results in a displacement of not only a certain quantity of energy from below upwards, but also a displacement of quality (innervation-character); hence the 'genitalization' of the parts affected by tie (excitability, tendency to rhythmical rubbing, in many cases definite orgasm). In cases of tie of 'constitutional narcissists' the primacy of the genital zone generally appears to be not quite firmly established, so that even ordinary stimuli or unavoidable disturbances result in a similar displacement."

The hysteric conversion symptoms are expressions of (genital) object love, clothed in the form of auto-erotism, while the ties and catatonias are auto-erotism which has to some extent adopted genital qualities.

C. W. FORSYTH.

### PSYCHOPATHOLOGY.

[113] Disorders of symbolic thinking due to local lesions of the brain.

R. MOURGUE. *Brit. Jour. Psychol. (Med. Sect.)*, 1921, i. 97.

This paper should be read in conjunction with the recent researches of Head. The author accepts the general principles laid down by Hughlings Jackson, and is largely, though not entirely, in agreement with Head's conclusions. Mourgue views the phenomena termed aphasia from a broad standpoint, and finds the fundamental trouble to be a loss of the 'fonction de découpage et d'opposition de l'intelligence'—discrimination and differentiation. Everything takes place as if the thoughts of the aphasic presented themselves sometimes as an undifferentiated mass, at others as isolated units. In either case all 'opposition' is impossible, and this allows more primitive instinctive reactions to reassert themselves. Intelligence and language are closely associated ('coulés dans le même moule'),

but in aphasia due to circumscribed lesions, vast regions of thought and instinctive mechanisms remain intact—even experience an increased activity—while higher integrative functions upon which symbolic thinking and language depend are interfered with.

Mourgue supports his thesis by reference to the autobiographical memoirs of aphasics, especially those of Dr. Saloz and Professor Forel; also by a comparative study of a highly developed modern language (French) with Chinese, citing for this purpose the recent work of Granet (*Quelque particularités de la langue et de la pensée chinoises*).

ALFRED CARVER.

[144] "A child is being beaten." A contribution to the study of the origin of sexual perversions. SIGMUND FREUD. *Internat. Jour. of Psycho-analysis*, 1920, iv, 371.

A NUMBER of people suffering from hysteria or an obsessional neurosis have experienced the phantasy: "A child is being beaten". It has feelings of pleasure attached to it, and at the climax of the imaginary situation there is almost invariably an onanistic gratification. Analysis brings out certain differences in the origin of the phantasy in the two sexes. In this abstract its origin in the female sex is alone dealt with. The first phantasies were entertained very early in life, before school age. The phantasy of beating goes through three phases. In the first phase the child being beaten is never the one producing the phantasy, but it is most often a brother or a sister. At first the person beating is an adult; later he becomes recognizable as the (girl's) father. The first phantasy is represented by the phase: "My father is beating the child whom I hate". The second phase—"I am being beaten by my father"—is the most important, although it has never succeeded in becoming conscious. It is a construction of analysis. The third phase resembles the first. The person beaten is never the father. Instead of one child being beaten, there are now a number of children present as a rule. In girls' phantasies it is usually boys who are being beaten. The first and third phases appear to be sadistic, whereas the second is undoubtedly of a masochistic nature.

Analysis shows that the affections of the child are 'fixed' upon her father. She dislikes the other children in the nursery, as they share their parent's love. Being beaten signifies a deprivation of love and a humiliation. The beating means: "My father does not love this other child: he only loves me". The phantasy gratifies the child's jealousy, and is dependent upon the erotic side of its life, but it is powerfully reinforced by its egoistic interests. It is "not clearly sexual, not in itself sadistic, but yet the stuff from which both will later come". The sexual life of the child has reached the stage of genital organization now that the incestuous love has made this premature choice of an object. None of these incestuous loves can avoid the fate of repression, leaving a sense of guilt. This sense of guilt causes the phantasy to become masochistic—that of being beaten by the father. This is now not only the punishment for the forbidden sexual relation, but also the regressive substitute for it; and from this latter source it derives the libidinous excitement which is from

this time forward attached to it, and which finds its outlet in onanistic acts. In the third phase, girls in turning away from their incestuous love for their father, with its genital significance, easily abandon their feminine rôle. They spur their 'masculine complex' into activity, and from that time forward only want to be boys. The persons now being beaten are boys who represent them.

Analysis of these cases aids in the discussion concerning the origin of the perversions. The view is confirmed that masochism is not the primary expression of an impulse, but has been turned round and directed against the ego under the influence of the sense of guilt concerned in the act of repression. Confirmation is also given to Freud's opinion that the Oedipus complex is the nucleus of a neurosis, and the infantile sexuality which culminates in this complex is the true determinant of the neurosis. What remains of the complex in the unconscious represents the predisposition to the later development of neurosis in the adult. Effects upon the character can be detected which are directly derived from the unconscious setting of the second phase. People who harbour phantasies of this kind develop a special sensitiveness and irritability towards anyone whom they can put among the class of fathers. It is possible that the same phantasy is the basis of the querulous delusions of paranoia.

C. W. FORSYTH.

- [145] **The psychopathology of puberty and adolescence.** (The Morison Lectures for 1921 and The Second Maudsley Lecture.)—SIR FREDERICK MOTT. *Jour. of Ment. Sci.*, 1921, lxvii, 278.

BRIEFLY stated, the theme running through these lectures is the establishment of the biogenic view of the development of dementia præcox and allied pre-pubertal and adolescent conditions, with the careful exposition of the changes demonstrable by histological examination in the reproductive organs and in the central nervous system which go to indicate a purely physiogenic as opposed to a purely psychogenic origin of dementia præcox.

Noting the frequent occurrence of mal-development of the generative organs in cases of idiocy and imbecility, Sir Frederick Mott proceeds to consider the circumstances applying in the case of the adolescent. Here the inherent life force of the individual, which so far had been expended on purely developmental activities, is diverted into two entirely new channels: (1) Energy has to be supplied to effect the new psychic adaptations rendered necessary by the maturation of the sexual instinct: and (2) Energy is required to support the process of spermatogenesis or ovogenesis which now comes into operation.

From these premises it is argued that, could demonstrable changes indicative of failure of function or of regression be found in the neural elements underlying the highest associational activities of the mind, i.e., in the intercalary neurones of the cortex, and also in the organs of reproduction, then there would be good grounds for regarding dementia præcox as essentially a condition arising from failure of the inherent vital energy, or, in other words, as a condition due to an inborn germinal defect.

With regard to (1), the author demonstrates that in cases of dementia



præcox there is a parenchymatous degeneration of the neurones, strikingly affecting the cell-bodies as opposed to the fibres, and particularly marked in the granule layers of the cortex. In the earlier cases of the disorder the lesion is restricted to the absence of the Nissl bodies which are normally to be seen in the stained nerve-cell, their place being taken by lipid granules which appear in the stained specimen as vacuolations in the cell, the lipid substance having been extracted in the process of preparation of the slide. In more advanced cases the appearances of marked nuclear and cytoplasmic disintegration are found, and in others a disappearance of the nervous element altogether. Such changes in the neurone itself are strictly comparable to those seen in senile dementia or dementia paralytica: but in these latter the evidences of vascular and interstitial fibrotic developments are predominant, whereas in the case of dementia præcox such developments are not present.

With regard to (2), Mott finds a definite regressive atrophy occurring in the testes and the ovaries in dementia præcox. In the male, spermatogenesis largely ceases and such gonads as are formed are mal-developed, while in the female the ova do not mature. These findings are quite restricted to cases of dementia præcox, for cases of dementia paralytica show active spermatogenesis up to the final stages of the disease.

The biochemistry of the nerve-cell is discussed, and the conclusion is reached that "the failure of function in dementia præcox may be correlated with a failure of oxidation processes in the grey matter, owing to a deficiency of the vital energy of the nucleus, as shown by morphological and biochemical changes in the nucleus and a failure in the production of the substance which is the antecedent of the Nissl granules." The actual relationship between the changes in the central nervous system and those in the generative organs is left open for the time, but it is pointed out that two hypotheses may be held. First, the two pathological conditions may be looked upon as co-existent and both dependent on some, as yet unknown, fundamental germinal defect. Secondly, regarding the generative organs as part of the general hormonopoietic system, it may be that the regressive changes in the generative organs with suppression, or at least diminution, of their normally produced internal secretion, may be the direct cause of the failure of the nervous function.

THOMAS BEATON.

[146] **The parataxes: a study and analysis of certain border-line mental states.**—T. V. MOORE. *Psycho-analytic Rev.*, 1921, viii, 252.

IN psychiatric work the importance of understanding rather than of naming abnormal mental states is insisted on, though names have their value. To facilitate this the author offers this study, with appropriate names for conditions that every psychiatrist has met, but for which he has not had satisfactory diagnostic terms. Though new names should be used with reluctance, the term 'psychotaxis' serves to signify a variety of facts which have much in common and which have not hitherto been subsumed in any general schema of mental abilities. The root *τάξις* (tropism) is to designate the tendency of the mind to adjust itself to pleasant and un-



pleasant situations. The tendency to make use of and enjoy pleasant emotions could be termed a positive psychotaxis, whereas the opposite tendency to avoid unpleasant situations is to be found in the negative class. These reactions are almost reflex in character, though they may be reinforced by conscious voluntary action. The positive psychotaxes do not vary much, though they may become associated with very complex mental operations. The negative psychotaxes, though varied, may be brought under the headings of (1) those that present no solution for the unpleasant situation, such as depression and anxiety; (2) those involving some kind of solution of the difficulty, however inadequate. With the latter there are three possibilities: (a) defence reactions; (b) compensatory reactions; (c) sublimation. An attempt to meet the situation squarely is a voluntary effort under the influence of intellectual insight and ideals of conduct, and is not a psychotaxis. Any of the negative psychotaxes if carried to excess may become pathological, and are then termed by Moore 'parataxes'. Just as the psychotaxes are related to instinctive and reflex reactions, so the parataxes may be considered as related to the psychoneuroses and the major psychoses.

The parataxis of depression is then discussed. Sadness is a natural emotion, but it is associated at times with an impulse to persevere in the sorrow, and though it would be wrong to look upon every tendency to maintain a state of depression as pathological, such normal tendencies are psychotaxes. Between them and the depressive form of manic-depressive insanity there are a number of conditions which block the individual's activities and are injurious to the normal mental development. Such are pathological, though to be distinguished from the psychoses. All these states shade into each other without any clear line of demarcation, but the question may be raised as to whether the parataxis of depression is not the root of the manic-depressive psychosis. Not every incident can call forth the tendency to remain sad; it must be one that profoundly affects the individual's hierarchy of desires. In every depression there are two factors—the native disposition as hereditary, organic condition, and the psychical factor. Treatment should consist in seeking the cause of the depression, analyzing the situation, reconstructing life's adaptations, and stimulating affective outlets.

The parataxis of anxiety, though having a constitutional factor, depends mainly on an apparently irreconcilable conflict between incompatible desires. Realizing the true reason for the condition is frequently sufficient to bring it to an end in cases that are not of long standing, but the fundamental cure consists in the solution of the dilemma. Examples of these parataxes of depression and anxiety are given and discussed.

C. STANFORD READ.

- [147] **Two unusual cases of parasexuality** (Ueber zwei ungewöhnliche Fälle von Parasexualität).—M. KIRSCHBAUM. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1921, lxiv, 136.

The first case was that of a medical man, age 30, who came under treatment for morphinism. The second was that of a student, age 22, who

while serving in the army in Flanders had neglected his correspondence with his relatives, had afterwards gone on the stage and won flattering press notices of his acting as a young hero and lover, and had then been lost sight of for some months, till one day he presented himself, coarsely dressed as a labourer, at the psychiatric clinic at Cologne; he was found to have scars of bilateral operation for cryptorchism; a brother stated that the patient had from childhood been untruthful, given to telling incredibly fantastic stories, and that another brother had committed suicide.

Of sexual perversion there is in neither case any evidence other than what the patients' own statements purport to furnish. The first patient, the medical man, said that he had never had heterosexual or homosexual intercourse, and had never masturbated, but that for some years he had been in the habit of secretly dressing himself in women's clothes, tying himself up in a constrained posture before a mirror, and so obtaining sexual gratification. The story the student told was that the sight of grimy labourers, and the thought of becoming one himself, produced in him a sexual excitement; that he had therefore desired to break from his family and become a labourer; that he had been obsessed with the idea that he was sexually imperfect; that he had several times had homosexual intercourse; that he was achieving success as an actor, and had formed an attachment to a young actress in his company, but that then his obsessions revived, so he disappeared from the stage, bought labourer's clothes, and worked for some months at the docks at Hamburg; and that now, coming to Cologne to enlist in the French Foreign Legion, he had been taken ill with pains in the chest, had consulted a doctor, and on his advice had come to the clinic as stated.

In each case the perversion is associated with an experience alleged to have occurred in childhood. The first patient said that one night, when he was little, his nightshirt was missing, so his mother put him into a lace-trimmed nightdress of his sister's; this gave him feelings of pleasure. The student said that from his window, when he was a child, he looked out over a house of correction; he often watched the convicts at work, and weaved romantic stories about them.

Kirschbaum, after remarking that such patients' statements must be received critically, accepts the alleged childish experience of each, and regards it as decisive in shaping the perverse behaviour. But I note that in neither case is there any independent testimony relating to that experience, or indeed anything to show that that experience, if it occurred, was in any respect decisive. Such patients are tempted, like other folk, by current opinion and example, and often also by medical suggestion, to excuse their misbehaviour by connecting it with something that happened before they were old enough to be responsible. I note that the student sets forth his childish experience, not in his voluminous main statement, but as an appendix or afterthought, evoked perhaps by leading questions; and that the other patient, a medical man interested in psychology, was exposed, like Kirschbaum himself, to suggestion from books in which childish impressions are declared to be important.

- [148] **Acute epidemic psycho-encephalitis and the psychic disorders of acute encephalitis (called lethargic)** (La psycho-encéphalite aiguë épidémique et les troubles psychiques de l'encéphalite aiguë dite léthargique). HESNARD. *L'Encéphale*, 1920, xv, 443.

THE association between such symptoms as somnolence and ocular palsies and those which are definitely psychical has been noted in the course of infectious conditions such as influenza and pneumonia, long before the more recently described syndrome at present known as lethargic encephalitis. There is noted at first slight incoherence, which becomes more pronounced. The patient feels ill, is anxious and restless. The pupils are either dilated or contracted. There may be strabismus. In the more severe cases there is ptosis, and sometimes paralysis of the facial nerve. Along with these symptoms there is an increasing somnolence, gradually merging into coma. The symptoms noted by various observers are extremely multiplex: stupor, catatonia, muscular rigidity, mental confusion, delirium, disorientation, and hallucinations. In some cases the condition suggests general paralysis of the insane, because of the mental state, and also because of the disorder of speech and the mask-like facies. Certain patients have an expression of astonishment.

The variety of the symptoms supports the contention of Cruchet that there is a very diffuse infection of the cerebrospinal axis of an epidemic nature, which shows itself in the different forms described as convulsive, myoclonic, chronic, poliomyelitic, neuritic, etc. The name suggested for this syndrome is diffuse epidemic encephalomyelitis.

Hesnard divides cases showing mental symptoms into two classes: one where there are psychic symptoms in association with the classic type of encephalitis and with the others mentioned, and a second which he designates psycho-encephalitis. The latter he subdivides into:

1. A psycho-somnolent variety where there supervene upon the ordinary symptoms of the encephalitis excitement, hypomania, confusion, followed by definite depression. The obscuration of consciousness may even suggest dementia.

2. Catatonic stupor without confusion but with unexpected mental lucidity considering their general appearance and behaviour. A curious symptom is observed in these cases. Muscular actions which have been commenced, such as chewing, stretching out the hand, putting out the tongue, etc., are arrested midway, comparable with the condition of the Sleeping Beauty and her entourage. This is due to an instinctive repugnance to effort—a kind of exhaustion of voluntary effort.

3. Acute delirium with great restlessness, hallucinations, incoherence, noisiness, and stereotyped movements. Pulse rapid, tongue dry; exaggeration or inequality of the reflexes. The prognosis in this variety is very grave.

4. Confusional type resembling the ordinary cases of confusion of a toxic character, with, chiefly, mental torpor.

5. Cases exhibiting the Korsakow syndrome, with disorientation, impairment of the memory, etc. This occurs only in those subject to

prolonged attacks of encephalitis with neuritic or, more frequently, poliomyelitic symptoms. It is often followed by some mental reduction.

These various forms may give rise to secondary psychopathic changes, especially in children. These have shown, for several months after their attacks, lack of interest, difficulty in memorizing, and general inaptitude with lessons. In addition to this there is a permanent change in character and temperament. The prognosis is not good in such cases.

Too little is known of the pathological anatomy and of the bacteriology of these conditions to allow of a clear interpretation of the cases. At present it is only possible to speculate as to where the primary trouble is—whether the disorder is in the brain itself, or if it is secondary to some pathological change elsewhere in the body which reacts upon the brain.

HUBERT J. NORMAN.

### TREATMENT.

[149] **Some aspects of mental hygiene.**—E. FARQUHAR BUZZARD.  
*Proc. Roy. Soc. Med.*, 1921, xiv, 1.

THE writer includes under the term of mental hygiene all measures which aim at the prevention of mental disorders, whether they are in the nature of neuroses, psychoneuroses, or psychoses. Its growth must be promoted: (1) By no longer misnaming mental disorders as nervous. It is necessary to tell the patients that their symptoms are mental and that these disorders are of everyday occurrence. (2) By getting rid of the confusion between ethical and medical principles as they affect health. (3) By teaching elementary principles of psychopathology and psychotherapy to students so that the general practitioner may take a prominent part in maintaining the mental health of individuals. He alone is able to detect which child in a family is finding difficulty in adaptation to the realities of life, or whether a threatening neurosis or psychosis is due more to inherent defects in the child or to external causes. (4) By obtaining general recognition for the multiplicity of factors concerned in producing mental as well as other disorders. The condition of the teeth, the lower bowel, the ductless glands, etc., may play a part in the production of mental disorder as well as the inherent constitutional factor and mental conflicts. (5) By giving due prominence to fatigue as a factor in psychopathology and to rest in psychotherapy. (6) By encouraging education in thinking as an important preventive measure.

The importance of psycho-analysis and other psychotherapeutic measures in the understanding, prevention, and treatment of mental disorders is emphasized.

C. W. FORSYTH.

[150] **Recreation for mental cases.**—R. F. L. RIDGWAY. *Amer. Jour. Psychiat.*, 1921, i, 87.

THE main object of recreation is to divert the mind of the patient from any morbid thoughts, feelings, or habits into more healthful channels, so that his life, as a whole, may be influenced beneficially. The forms of recreation may be said to fall roughly into two classes, those in which there

is a necessity for some effort, some degree of initiative, some attempt to control and fix the attention, and those in which none of these efforts are required. The first of these are undoubtedly of much greater value than the latter. They may again be divided into those activities in which there is no end-product from a utilitarian standpoint except physical health, such as in all games and exercises, and those in which something definite has been accomplished, something of value which tends to increase the patient's self-respect by making him feel that he is of some use in the world. All forms of entertainment have their value. The idle class, the unsociable, the dirty and destructive, the demented and those who are becoming so, have to be provided for. Two distinct lines are being followed—physical exercises and games under a physical therapist, and occupation under a vocational teacher. The instinct of play is the most useful of all instincts in reaching patients, because of the accompanying pleasure and of the stimulating effect and the instinct of rivalry which is called out.

Probably the most useful therapeutic measure is that of the industries and the arts and crafts. The greatest good is not accomplished until we have our patients at something useful. A variety of occupations should be in vogue to suit different capacities, and to ensure that something may be found to interest each patient, in order that no one may be compelled to work too long at one thing and so lose interest in it. Almost all classes of patients can be helped, and often in certain ways the destructive tendencies of some may be diverted into useful channels. The author gives brief details of many suitable occupations in institutions, and he points out that, when occupied, the patients are not only more contented, but they are less destructive, they deteriorate less rapidly, and in the so-called 'curable' cases convalescence is hastened. It is just as needful to provide recreation as it is to provide food and clothing.

C. STANFORD READ.



## Reviews.

**Syphilis und Nervensystem.** By Dr. MAX NONNE. Fourth Edition. Pp. 1010. with 169 illustrations. 1921. Berlin: S. Karger. M.320.

THE five years which have elapsed since the appearance of the last edition of Nonne's well-known book on syphilis of the nervous system have added considerably to our knowledge of this subject, and also raised new problems, many of which still remain unsolved. It is the consideration of these that are the chief cause of the increase in size of the present volume, but it must be admitted that the value of the book has grown with its bulk.

Among the new features, mention may be made of the interesting pages in which the question of 'syphilis à virus nerveux' is discussed in the light of the most recent investigations; that is, whether a special 'neurotropie' variety of the spirochæte exists which affects predominantly the nervous system, in contrast to the ordinary 'dermotropie' variety which involves, by preference, the skin and other tissues. The author arrays a large amount of evidence both in favour of and against this hypothesis, but concludes that this matter cannot be yet regarded as settled, though there is much clinical and pathological evidence in favour of it. A considerable amount of space is also devoted to the inheritance of syphilis, particularly to the occurrence of syphilitic lesions in the nervous system in the third generation; he believes that this is probably much more common than is generally supposed. In another chapter the value and significance of the most modern serological and other tests for syphilis, and particularly their application to the cerebrospinal fluid, are discussed fully.

But perhaps the most instructive chapter is that devoted to the treatment of nervous syphilis. When twelve years ago Ehrlich introduced salvarsan, the early enthusiasm aroused by the almost marvellous effects that it produced on certain syphilitic lesions threatened displacement of older remedies, or to discount their value as compared with that of the newly discovered drug. Nonne's critical review of the results obtained by himself and others during the last twelve years is the more important when his early advocacy for salvarsan is remembered. His judgement is that mercury, when properly administered, is the surest and the safest means, not only of removing the symptoms, but of treating the disease. Salvarsan, in his experience, has no advantages over mercury, though he admits it is often a useful ally. He also brings forward a series of important facts which tend to show that this is so in the treatment, not merely of nervous syphilis, but of the primary and secondary stages of the disease too. His own statistics reveal an enormous preponderance of nervous lesions in the early years after infection in patients treated by salvarsan, in contrast to the number which occur at this period in the untreated and those to

whom mercury was administered. The earlier development of tabes and general paralysis after the treatment of syphilis by salvarsan, to which others too have drawn attention, is also noted by the author, though he admits there has not yet been sufficient time to enable us to acquire demonstrative statistics.

Tabes dorsalis and general paralysis are not dealt with in detail, since the author still holds that neither can be regarded as an ordinary syphilitic affection of the nervous system; he maintains they are special diseases characterized by clinical and pathological features not common to nervous syphilis in the ordinary sense of the term.

This volume is certainly the most complete clinical account of the subject with which it deals, and is consequently an extremely valuable book of reference to the general physician as well as to the neurologist. Unfortunately the poor paper on which it is printed has not allowed a satisfactory reproduction of the otherwise excellent illustrations.

GORDON M. HOLMES.

**Psychology from the Standpoint of a Behaviourist.** By J. B. WATSON.

Professor of Psychology, The Johns Hopkins University. Pp. 429.

Illustrated. 1919. Philadelphia and London: J. B. Lippincott Co.

10s. 6d. net.

BEHAVIOUR psychology has undergone a rapid development in America, where it is the direct outgrowth of much productive work on animal behaviour. Professor Watson is one of the leading exponents of the new school, and this is the first elementary text-book written from the strictly behaviourist standpoint. The aim of the behaviourist is to bring psychology into line with other sciences and to approach it according to the universal methods of science. Thus mental phenomena, the usual subject matter of the psychologist, are in this volume excluded from consideration. They may exist, but they are not regarded as amenable to scientific treatment, presumably on the ground that they cannot be directly observed except by their subject. This method of study, which would seem to exclude introspection as a source of knowledge, naturally involves a special terminology; Professor Watson, in order to avoid words with subjective implications, therefore confines himself to the description of behaviour in terms of movement responses. There is no discussion of consciousness and no reference to such terms as sensation, perception, will, attention, and the like.

The opening chapter is concerned with the definition and scope of psychology, and with its relation to physics, neurology, physiology, and medicine. Behaviourism is exclusively concerned with the organism in action, with the response of the individual to his environment, and its aims are to "predict human activity with reasonable certainty", and to formulate "laws and principles whereby man's actions can be controlled by organized society". The various types of possible response are classified under four main headings: (1) Explicit habit responses: tennis playing, talking, building houses; (2) Implicit habit responses: thinking (here

described as subvocal talking), bodily sets or attitudes, conditioned reflexes; (3) Explicit hereditary responses: sneezing, dodging, fear reactions; (4) Implicit hereditary responses: endocrine secretions, changes in circulation. In subsequent chapters these various types of response are studied in detail.

The second chapter is concerned with the various psychological methods, and these the author classifies under the following headings: (1) Observation with and without instrumental control; (2) The conditioned reflex methods; (3) Verbal report method (speech reactions); (4) Methods of testing (intelligence, vocational tests, etc.).

After these preliminary considerations a chapter is devoted to the physiology of sensation, and following this study of "the receptors and their stimuli" an account is given of the further details of sensory-motor adjustment in two chapters which deal with the nervous system (neuro-physiological basis of action), and the muscles, excretory organs, and ductless glands (organs of response).

Subsequent chapters are devoted to hereditary modes of response—emotion and instinct—and Professor Watson furnishes an account of some of his own experimental work on children. On the basis of his observations he expresses the view that *fear*, *rage*, and *love* (in the Freudian sense) are the emotional reactions belonging to the original nature of man. The subject is dealt with exclusively in terms of situation and response, and subjective terms such as feeling, desire, need, and so on, are not referred to or utilized in any way.

Memory is here defined as "a general term to express the fact that after a period of no practice—explicit bodily habits, explicit word habits—the function is not lost, but is retained as part of the individual's organization, although it may, from disuse, have suffered from greater or lesser impairment."

A special chapter is concerned with language, speech being "explicit language habits"; and thought, which is here re-defined in conformity with behaviouristic psychology, is described under the heading of "implicit language habits" or "subvocal talking". This is perhaps the most important chapter in the book, as it sets forth the basic doctrine of the behaviourist. This is, that thought is no more than implicit behaviour. "It is not different in essence from tennis playing, swimming, or any overt activity, except that it is hidden from ordinary observation, and is more complex, and at the same time more abbreviated as far as its parts are concerned than even the bravest of us could dream of. Thought is highly integrated bodily activity." Such a theory is assimilated with difficulty, as it would reduce thought to kinæsthetic sensations, and involves a denial of the image as distinct from sensation. Quite apart from any metaphysical theories, the existence of images as an empirical fact can scarcely be disputed. A., playing tennis, is making a series of explicit adjustive movements to an observed situation. A., thinking of playing tennis, is making a series of implicit adjustive movements to an imagined situation. It is characteristic of thought that it should refer to some situation—present, past, or future—and it is most difficult to understand how, for

instance, a vivid and intense visual image is explicable on the basis of slight muscular movements. In a measure this theory of thought would seem to weaken rather than strengthen the behaviourist position, because it is contrary to the facts of daily experience. Cognition is too fundamental a fact about the human being to be ignored successfully by the psychologist, and somehow or another it will have to be taken into account.

From the brief outline that has been given of the contents of this volume, it will be seen that Professor Watson adopts the conventional method of the psychologist in presenting the subject to the student. He artificially divides up the individual reaction systems of the individual for the purposes of description, just as it is customary to describe states of consciousness under the headings of cognition, conation, and affection. Having thus described the various part activities, he devotes the final chapter to the consideration of the totally integrated individual in action, or the personality and its disturbances. His practical treatment of this subject is useful, but the chapter is short, and, as the author explains in the preface, by the time attention has been paid to the necessary part activities there is but little space to consider the totally integrated individual.

This volume contains much of interest, and Professor Watson writes with clearness, vigour, frankness, and courage. It is doubtful, however, if his theoretical views will find general acceptance, and they would seem to need much more evidence to support them than is at present forthcoming. Consciousness as a fact cannot be dismissed in a few abrupt and vigorous phrases, and the reader will still probably feel after reading this volume that man has a psychophysical rather than a merely physical organization. As a method of approach, and on practical grounds, behaviourism may well be left to take care of itself, and it may be relied upon to furnish contributions of value to psychology. As a reaction against academic introspectionism its significance is readily to be understood, and by its emphasis on action rather than thought it has already exerted a considerable and beneficial influence upon normal psychology. The psychopathologist long ago discovered that the academic psychologist was unable to afford him much assistance in elucidating the problems he was called upon to solve, and he has tended naturally to develop a psychology which, in many respects, is closely allied to behaviourism. The aims are similar, though the methods and terminology differ.

H. DEVINE.

**The Clinical Examination of the Nervous System.** By G. H. Monrad-Krohn, M.D. (Christiania), M.R.C.P. (London), M.R.C.S. (England). Lecturer in Neurology at the Royal Frederick University, Christiania. Crown 8vo. Pp. xvi + 135. 1921. London: H. K. Lewis & Co. 6s.

It is no easy matter to condense within a small compass a complete scheme of neurological examination; yet Dr. Monrad-Krohn has succeeded in presenting in a slim volume of less than 150 pages a detailed and practical account of the methods available in the study of nervous disease. The



subject is not one which is capable of great variety in the manner of its treatment, and Dr. Krohn adheres closely to the order of examination usually followed in British schools; but he has shown sound judgement in including an outline of the examination of the mental state of the patient.

Now and then the reader meets with novel phrases, and there is an occasional error in spelling; in the section devoted to aphasia there is one curious omission—nothing is said of the importance of ascertaining the right- or left-handedness of the patient. The author has included a number of diagrams, some of which are not particularly well executed or altogether free from error. In diagram 11, for example, the position of the gracile and cuneate nuclei is wrongly indicated. However, these are only venial faults, and are well atoned for by the general excellence of the book, which can be cordially recommended to all students wishing to acquire a reliable method of neurological examination.

#### Therapeutic Immunization in Asylum and General Practice.

By WILLIAM FORD ROBERTSON, M.D. Demy 8vo. Pp. vii+278.  
1921. Edinburgh: E. & S. Livingstone. 15s.

IN these days, when most forms of chronic nervous and mental disease are generally attributed to buried psychic complexes, it is refreshing to find a writer who, with equal dogmatism, bases their etiology on bacterial infection of the intestinal tract. Dr. Ford Robertson has long considered *tuberculosis dorsalis* and *progressive general paralysis* to be due to an infection with diphtheroid organisms, but his earlier views of these diseases have been modified to some extent. He now allows to syphilis the rôle of a predisposing factor in that it damages the blood-vessels of the central nervous system and allows 'neurotoxic' diphtheroid bacilli to attack the nervous tissues. The field of action of these bacilli has now been widened to include all cases of neurasthenia and disseminated sclerosis. In these diseases he has constantly found anaerobic diphtheroid bacilli in the stools, and by injections of the dead bodies of these bacteria has been able to modify the course of the disease. Perhaps the weakest point in his argument is that he places implicit trust on the immediate effects of such injections as proofs that the organism injected is the *causa causans*. Throughout the book he frequently uses phrases such as "the evidence that anaerobic diphtheroid bacilli are a cause of neurasthenia lies in the phenomena observable when therapeutic immunization is carried out."

Diphtheroid bacilli are also considered to be the chief cause of certain mental diseases such as *dementia præcox*, *manic-depressive insanity*, and some forms of *acute insanity*. In these diseases they are aided by various neurotoxic cocci.

*Exophthalmic goitre* is "determined by the involvement of the cervical sympathetic nervous system in the neurotoxic action of intestinal diphtheroid bacilli." In this disease there is usually also heavy infection with the *Streptococcus fecalis hemolyticus* and the pneumococcus.

A new discovery is that *diabetes mellitus* is directly due to a special anaerobic streptothrix with amylolytic properties. This organism was



constantly found in diabetes, and frequently in other nervous disorders associated with glycosuria. Rats when fed on this organism developed glycosuria, and some died in diabetic coma. The author was not, however, able to cure the disease by therapeutic immunization against the streptothrix. This he explains on the supposition that a centre in the brain which governs sugar metabolism has already been damaged when the disease is sufficiently advanced to be recognized.

Many other forms of disease are also specified with regard to which the author's ideas are more in consonance with those of the majority of the profession. His claims in the territory of nervous diseases, however, appear to need more substantial proof before they are generally accepted. We should like to know, for instance, what results have been obtained by the experimental injection of the toxins of his 'neurotoxic' strains of bacteria. The evidence that these strains are 'neurotoxic' appears at present to be purely clinical, and there is at least a possibility that they produce their effects on the nervous system by some less direct mechanism. Thus it may be true that many forms of nervous and mental disease are due to alterations in the functions of the ductless glands, and certain of the latter appear to be influenced by enterogenous toxæmia. This, however, does not appear to be quite the same thesis as that propounded by Dr. Ford Robertson, to whom the direct neurotoxic action of the bacteria appears to be the chief factor in determining disease in the nervous system.

J. G. GREENFIELD.

**The Anatomy of the Nervous System from the Standpoint of Development and Function.** By STEPHEN WALTER RANSOM, M.D., Ph.D., Professor of Anatomy at North-western University Medical School, Chicago. Pp. 395. With 260 illustrations, some in colours. 1921. Philadelphia and London: W. B. Saunders Co. 32s. 6d.

PROFESSOR RANSOM has written a useful book on the anatomy of the nervous system, which is particularly well illustrated and in which morphological details are clearly set forth. It is true many of the illustrations are culled from other sources, and not a few are now becoming somewhat hackneyed, but it cannot be said that this detracts from the value of the book. Its general format leaves nothing to be desired.

Though in the introduction the author emphasizes the importance of the dynamic as opposed to the static point of view in the study of the morphology of the nervous system, we are of the opinion, on a perusal of his work, that it is less satisfactory on the physiological than on the anatomical side, and that if clinical data are to be utilized at all, they should be incorporated on a less sketchy scale. Thus, for example, a few lines (p. 295) are devoted to aphasia, but a mere paragraph can serve no useful purpose. Similarly, a brief reference to the Brown-Séquard syndrome (p. 112) shows the impossibility of giving an adequate account of that condition in seven lines.

On the strictly anatomical side the student of the subject will find in the book a sound compendium of knowledge, based on the most recent investigations and embodying not a little hitherto not commonly given in

text-books of anatomy. On the other hand, we have not noticed any mention of the central tegmental tract, and in the descriptions of the nucleus antigonus, facial nucleus, and others, some details of the localization within these nuclei might have been given. The fasciculus peduncularis transversus is mentioned in the appendix on neuro-anatomical dissection, but apparently is not described in the text. As a whole, however, we can recommend the volume to the favourable consideration of neurologist and student.

**The Psychology of Day-Dreams.** By J. VARENDONCK, formerly Lecturer in the Paidological Faculty of Brussels. With an introduction by Prof. S. FREUD. Pp. 367. 1921. London: Geo. Allen & Unwin. 18s. net.

PSYCHOLOGISTS will be grateful to Dr. Varendonck for so fearlessly laying bare his personal tendencies, both egoistic and libidinous, in an endeavour to clarify our notions regarding 'foreconscious thinking' and its relations to other modes of thought activity.

Dr. Varendonck became interested in psycho-analysis while serving as interpreter with the English during the great war, and he gracefully addresses himself directly to English readers because they are "of all nations those who show the greatest interest in psycho-analysis." Professor Freud contributes an appreciative introduction, in which, whilst refraining from criticism, he points out that the term 'freely-wandering' or 'phantastic' thinking is preferable to 'foreconscious' which the author has adopted. The first section of the book is devoted to an analysis of the genesis, contents, and termination of chains of 'foreconscious' thinking. Everyone thinks foreconsciously, but whilst in the normal subject realistic reflection hinders the overgrowth of autism, in the neurotic affects gain the upper hand and interfere with consciously directed thought. One type of foreconscious thinking proceeds by chains of recollections each associated with its own affect. A second and more important type is that in which the affect belongs to the end-idea and is directed by a wish. Thus frightening situations (e.g., bombardment) arouse no fear if recalled, not for themselves, as it were, but for an ulterior purpose. Recollections of this type are more than mere recollections: they are in part new creations arising in attempts at the solution of some problem. Varendonck reproduces the text of a day-dream in the form of question and answer, thus portraying it more clearly in the light of a problem the solution of which is being attempted by a series of suppositions. The method by which the foreconscious deals with the conditional mode is, by this means, cleverly depicted, and is shown to correspond with that which obtains in nocturnal dream-work.

The second section of the book is synthetical, and deals with the affective aspect of memory, apperception, and ideation. Varendonck considers that in foreconscious thinking the relation between memory and affect is causative. A foreconscious thought is the result of a mental operation by which a memory element recalled by a wish becomes a perception preparatory to or in fulfilling the wish. The discussion on the relation between 'wish' and 'will' is particularly illuminating. Varendonck shows

that wishes may be described as volitions in the affective stage, or, conversely, that volition is originally an acknowledged wish, which has become conscious and relatively free from affect. The foreconscious wish is an expression of a tendency towards adaptation. If the adaptation is not in accord with our present conventional standards it is repressed, but if the wish accords with our ego-ideal the will re-enforces it. This investigation tends to show that unconscious, foreconscious, and conscious thought processes are but three manifestations of the same fundamental adaptive function.

Although there is nothing definitely original in Varendonek's thesis, his trained self-analysis results in a presentation of certain psycho-analytically established mechanisms in a new and stimulating light. So much is this the case that in reading his pages the reviewer often fancied for a moment that new ground was being broken. The work is distinctly a valuable contribution to psycho-analytical literature.

ALFRED CARVER.

**Vom seelischen Gleichgewicht und seinen Störungen** (Mental Balance and its Disturbances). By WALTER GUT. Pp. 163. 1921. Zurich: Art. Institut Orell Füssli.

THIS brochure gives a popular exposition of psycho-analytical findings as they may be applied to the elucidation of those milder neurotic disturbances which are met with in everyday life. It is somewhat on the lines of Stekel's popular works, but Gut, particularly in his final chapter, appears to have a religious bias.

In the first chapter Gut shows, with well-chosen examples, that every physical disturbance or defect, whether innate or acquired, has a tendency to produce an alteration in the psyche. He then passes on to consider the disturbances of mental balance which arise in the nervously predisposed, and deals successively with the influence of infantile experiences and disturbances occurring during the course of subsequent development, here tracing the cause and effect of numerous family conflicts. No acknowledgements or scientific references are made, but the subject is clearly though superficially expounded, and good examples are employed.

Gut next considers the effect upon the individual of present-day social conditions, and contrasts these with those obtaining in former ages. Finally, the problem of how to conserve mental health is dealt with. Gut emphasizes the fact that the content of consciousness is only a fraction of our psychic life, and counsels everyone to get in touch with his unconscious tendencies. He points out the danger of repression and of taking refuge from reality in phantasies, and also of allowing fixations in the past to occur and hamper us. This chapter is replete with biblical quotations; but it is doubtful how far such advice as, for example, "Let the dead bury their dead" or "Take no thought for the morrow", is likely to be helpful to the neurotically disposed individual.

As a popular exposition this little book doubtless has its place and should serve a useful educative purpose.

ALFRED CARVER.

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## Original Papers.

### THE NATURE OF MENTAL DEFICIENCY.

BY A. F. TREDGOLD, LONDON.

THE term 'mental defect' may be applied to any marked falling away from that degree of mental capacity which is the normal or average in the race to which the individual belongs. Strictly speaking, it covers decay as well as imperfect development of mind; indeed, the Royal Commission on the Feeble-minded suggested that it should be used for all forms of mental disease, including insanity. Wisely, I think, this suggestion has not been adopted, and the general tendency is to restrict the term to conditions of imperfect mental development, and to exclude both perversion of mind (insanity) and decay of mind (dementia).

It is very necessary to point out, however, that imperfection or defect of mental development is not necessarily synonymous with mental deficiency in the legal sense. The Mental Deficiency Act lays down certain criteria, and these necessitate the defect being of a particular kind before a person can be regarded as a defective in the eyes of the law; in other words whilst legal mental deficiency is due to a psychological defect, a mind may be defective without the person being legally mentally deficient. I shall deal with legal mental defect presently; for the moment, and as a preliminary to the understanding of this, I propose to consider some points regarding mental defect from the wider standpoint.

It is clear that before we can discuss what constitutes defect of mind we must know what processes go to the make-up of normal mind. Our knowledge regarding this, however, is admittedly very

imperfect: mind is the sum total of such an elaborate series of processes of the most intricate interdependence that the attempt to analyze it into its component parts is fraught with the utmost difficulty. Nevertheless such an analysis is clearly necessary for the purpose in view, and the most helpful method would appear to be to consider mind from its evolutionary and comparative aspects: that is, to study mental manifestations as they occur at different stages of evolution and in individuals of different mental capacity. As a result of purely clinical observations of this kind, I think we may arrive at certain tentative conclusions as to the chief processes of mind, and I have endeavoured to represent these in diagrammatic form in the hope that they may in some measure elucidate the nature of mental deficiency.

At the outset it is desirable to state that although it will be convenient to speak of mental functions as if they were independent entities, I am far from suggesting that mind is divided into watertight compartments or that these various functions really exist independently. This, of course, is by no means the case, and there are probably few, if any, manifestations of mind which are not the resultant of many of these processes. Moreover, as I have already remarked, the difficulty of analysis is so great that the divisions made must be regarded as purely tentative. Clinical examination, however, would seem to show that the processes to be described are subject to such variations of development in different individuals, in some cases being so imperfect as to constitute a distinct psychological defect, that for our present purpose it is convenient, and indeed justifiable, to regard them as psychological entities.

#### OUTLINE OF NORMAL MENTAL EVOLUTION.

The functions of mind may be divided into three main groups, namely, *perception*, *apperception* or *assimilation*, and *feeling*; and we may consider these at four different evolutionary levels. The lowest level (*Level 1, Fig. 1*) represents the primitive vertebrate type of nervous system, consisting of afferent and efferent pathways and central ganglia. An animal of this type has in all probability no consciousness and is incapable of willed movements. It performs movements which are highly complex and co-ordinated, but these are essentially reflex and conditioned by the incoming stimuli and the nature of its innate tendencies (instincts). We must conclude, however, that such a primitive central nervous system is pregnant with vast potentialities for future evolution.

The next level we may consider (*Level 2*) is that of the higher mammals. This stage is characterized by an increased development and a differentiation of the neuronic germs into the three psychic



processes, perception, apperception, and feeling. Perception at this level consists mainly in the ability to form simple mental images of objects actually present to the senses (percepts): but there is in all probability some capacity for forming simple ideas, or concepts, of objects not actually present. Apperception consists of attention (mainly passive), simple comparison, and will, and these result in a simple capacity for modifying the reflex action which, at a lower level, would result from external stimuli and instinctive tendencies, in accordance with such simple percepts and concepts: in other words, for transforming purely reflex action into action to some extent in accordance with the requirements of the immediate environment. Feeling, in the main, consists of a consciousness of the general pleasantness or unpleasantness of the sensations experienced, but there is probably also some capacity for experiencing such simple primary emotions as fear, anger, affection, etc.

*Level 3* is representative of the mind of primitive man living a communal life, and these mental functions have undergone a still further elaboration and differentiation. Perceptive processes are now divisible into three classes: firstly, the individual is capable of forming more elaborate percepts and concepts and of a simple train of thought: secondly, there has now been evolved a capacity for forming simple abstract ideas, such, for instance, as those of goodness, badness, powerfulness: and, thirdly, he has now capacity for simple symbolic imagery. This last is a very important factor in subsequent intellectual development, but at this stage it goes little beyond the ability to recognize that a certain totem is symbolic of a particular tribe, that a particular head-dress or ornament is symbolic of power or office, and that certain rude hieroglyphics represent certain ideas. Feeling has similarly evolved: not only have emotions become more complex, but certain of them have become organized into groups of simple sentiments. Thus, such emotions as awe and wonder have given rise to a simple religious sense: emotions of affection, self-respect, and fear of the consequences of transgressing the social code have combined to produce a sentiment regarding the rightness or wrongness of certain acts: in other words, an elementary social sense: similarly the feelings of attraction and repulsion roused by certain colours, forms, and tastes have resulted in the development of a primitive aesthetic sense. Apperception has undergone a similar evolution. Attention, which was formerly largely passive, has now given rise to active attention, and at this level it seems possible to differentiate apperception into three processes, namely, a capacity for comparing ideas and forming simple judgements, an ability to foresee the proximate consequences of actions (prevision), and an increased power of volition. At this level, therefore, we may regard the per-

ceptive functions as having evolved into a capacity for thought, the apperceptive into intelligence, and those of feeling into more complex emotions and simple sentiments. The net result is that the individual is now able to form ideas as to his surroundings, to appreciate simple symbols, to perceive simple causal relationships, to experience emotions regarding a God, right and wrong, and tribal obligations, to form simple judgements, to make simple plans, and generally to adapt his conduct, not only to the requirements of the immediate moment, but to those of the near future.

In *Level 4* we have arrived at civilized man, and this stage is characterized by an increased development of each of these mental functions. The perceptive group forms the basis of learning, and is made up of (1) Complex concepts, thought and imagination; (2) Complex abstract ideas; (3) Symbolic perception, e.g., alphabetical signs, numerals, musical notation. The apperceptive group is the basis of that higher quality of intelligence which we may term wisdom, and consists of (4) Deliberation, discrimination, and reasoning; (5) Volition and resolution; and (6) Prudence, planning, and inventiveness. Feeling, in addition to an increased complexity of emotion, has now evolved into definite (7) Aesthetic, (8) Religious, and (9) Social, and its still higher development, Moral sentiment.

In consequence of this higher mental evolution, the average normal civilized man has capacities for learning and feeling, together with apperceptive functions enabling him to utilize and apply these capacities, which place him on a considerably higher plane than his primitive ancestors. His increased knowledge of his surroundings, his higher development of sentiment, his greater powers of deliberation, mental comparison, judgement, invention, and volition, now enable him to make plans, not merely for near but for remote contingencies, and to modify his instinctive impulses to action in accordance with the plans so made. And it is this capacity for more elaborate concepts and sentiments, with the increased power of inhibiting his instinctive tendencies and acting in accordance with such higher ideals and sentiments, which constitute the essential difference between a civilized, as compared with a barbaric, people.

### PSYCHOLOGICAL DEFECT.

But, whilst such a degree of mental development is characteristic of a civilized community in general, it is obvious that the individuals of such a community differ from one another very considerably. In the first place they differ regarding their general evolutionary level, some being nearer and others much further away from the stage of primitive social man. Secondly, they differ as to the relative development of the three main psychological processes, some being

characterized by much learning or much sentiment, with but little wisdom; others by plenty of sound common sense with but little learning or sentiment, and so on. It is to variations of this kind that differences in character and personality are due, and they must be regarded as variations within the normal developmental range.

There are, however, other individuals who would appear to be at the extremes of, or even outside, this normal range, inasmuch as they are characterized by an excess or defect of development of certain mental processes of such a degree as to constitute a decided abnormality. A greatly increased development of a particular mental process may give rise to genius, as distinct from all-round ability; a marked under-development constitutes a psychological defect. With regard to defective development, there are, for instance, individual members of every civilized community who are so lacking in the perceptive functions of mind as to have practically no capacity for abstract learning, and who, in this respect, rank little higher than *Level 3*. Further, there are individuals who are defective in one of the higher perceptive processes only, such as that for complex abstract ideation or for symbolism. It is probable that such a defect of symbol perception is the cause of that inability to learn to read or to sum which is known as word or number blindness, and which is by no means uncommon in school children. Similarly with the processes concerned in feeling, there are persons whose capacity for emotion and sentiment is little higher than that possessed by primitive social man: there are others who, whilst having attained to *Level 4* with regard to one sentiment, such, for example, as that of æsthetics or religion, are markedly deficient in moral or social sense. The apperceptive functions may in like manner be markedly under-developed in whole or in part, and there are persons who have good powers of active attention and volition, with but little ability to discriminate, reason, profit from experience, or make plans. Conversely, there may be considerable ability for planning and inventiveness, with a marked inability to adapt the general conduct to the practical requirements of life.

Since marked abnormalities of this kind and I am here only speaking of those cases where they are marked are due to the developmental arrest of processes which are normally present in the individual's compeers, we may, I think, rightly look upon them as psychological defects, and from the strictly literal point of view such persons may be said to be mentally defective.

#### LEGAL MENTAL DEFICIENCY.

There is, however, a great difference between mental defect in the literal and in the legal sense, just as there is in the case of

mental disorder. The Mental Deficiency Act of 1913, which is the authority on this matter, has clearly laid down that to be a mental defective in the eyes of the law there must be such a defect of mind as to render the individual incapable of discharging his obligations as a member of the community. In other words, the term mental deficiency is applied with a restricted and specific meaning, and the criterion of its presence is a social one. It is true that the Mental Deficiency Act does not define mental defect as such, but it specifies

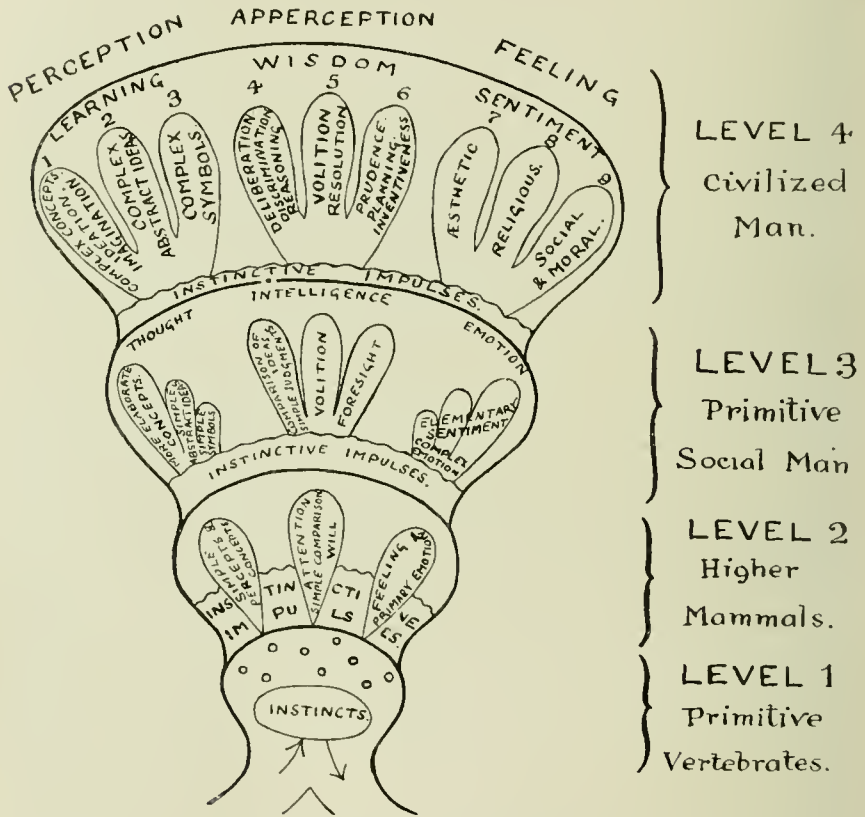


FIG. 1.—Scheme of normal mental evolution.

and defines four classes of this condition, and these definitions make this point quite clear.

Thus, to quote from the official definitions of these four classes, *idiots* are "unable to guard themselves against common physical dangers"; *imbeciles* are "incapable of managing themselves or their affairs"; *feeble-minded* are persons who "require care, supervision, and control for their own protection or for the protection of others"; and *moral imbeciles* have "strong vicious or criminal

propensities on which punishment has had little or no deterrent effect”.

The question we have therefore to consider is, What is the particular psychological defect which constitutes legal mental deficiency?

With regard to the perceptive faculties, it is clear that while ideation and imagination, ability to form abstract ideas, and an appreciation of complex symbols—in short, a general capacity for learning equivalent to that of *Level 4*—are necessary if an individual is to hold an average place in a civilized community, he can yet maintain



FIG. 2.—Subnormal type.



FIG. 3.—Defect of wisdom. A moral, conscientious, learned fool.

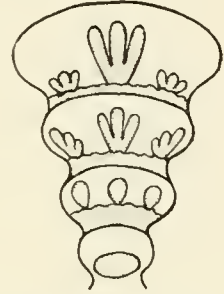


FIG. 4.—Defect of learning and sentiment, but abundant ‘common sense’.



FIG. 5.—Potential criminal. Defective moral (?) and religious) sentiment.

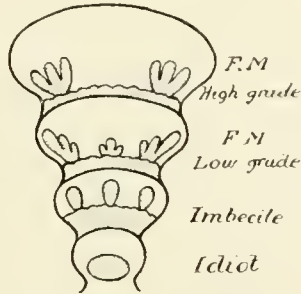


FIG. 6.—Grades of legal mental defect.

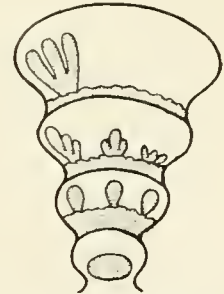


FIG. 7.—Moral imbecile.

existence in the humbler walks of life in such a society with perceptive functions of a development equal to *Level 3*, and as a matter of fact a considerable number of persons in every civilized society do manage thus to hold their own with no higher mental equipment—they are the hewers of wood and the drawers of water. Defective educability, therefore—that is, mere inability to progress in school—does not by itself of necessity constitute mental deficiency in the legal sense, and this is a fact which has to be borne in mind in devising and applying the serial tests which are now in such common use. On the other



hand, an individual who in this respect falls below *Level 3*, and who is incapable of abstract ideation or of the perception of elementary symbols, will thereby have such an inadequate appreciation of his surroundings as to require some degree of supervision and control, and such a person will be a defective.

In the case of the emotional processes, it is also obvious that whilst an aesthetic and a religious sense are desirable attributes in a member of a civilized society, they are by no means essential to the maintenance of existence without supervision, as is amply proved by the life histories of many persons who are quite devoid of these qualities. With regard to moral or social sense the case is somewhat different. It might be expected that a person who was quite devoid of this sense, and who was lacking in any feeling of right or wrong, of honour or honesty, or of social or moral obligation, would be incapable of conforming to the codes and laws established by the community, and would in consequence need protection and supervision for the sake of others. This probably is so in the somewhat rare cases in which this sense is completely absent, and such persons comprise the class known as moral imbeciles: there are, however, many persons in whom this sense, whilst not being entirely absent, is yet markedly under-developed, and then the result would appear to depend upon the amount of wisdom they possess. If gifted with a moderate amount of this, although the contemplated commission of a crime may arouse no feelings of repugnance, they yet realize that if they are found out the disadvantages, in the long run, will probably outweigh the advantages, that on the whole "honesty is the best policy", and in this way their apperception usually suffices to keep them within the law. Such persons are not habitual criminals and do not conform to the statutory definition of moral imbeciles: they are, however, potential criminals, they are habitually apt to sail very close to the wind, and they will commit crime if the chances of detection seem slight probably they may be highly successful men of business. It would therefore appear that a development of the processes of feeling equal to, or even less than, that of primitive man, provided intelligence be present, is sufficient to prevent the individual being certifiably mentally defective.

In the main it is the apperceptive functions which are chiefly concerned in influencing the conduct of the individual, since it is these which enable him to exercise the necessary control over his instinctive impulses and to adapt his actions to more remote considerations and contingencies: consequently it is the degree of development of apperception which chiefly determines the legal status of the individual. While it seems probable that a development equal to that of *Level 4* is essential if he is to hold his own in a complex environment.

an amount of intelligence no greater than that of primitive social man (*Level 3*) will suffice under simpler surroundings. Such a poorly equipped individual will necessarily occupy a low status in the community, but he will have sufficient intelligence to manage his affairs at this level, to make suitable plans for contingencies not too remote, and to deal successfully with the requirements of his station: he will not, therefore, be a mental defective. It is probable, however, that *Level 3* represents the minimum of intelligence compatible with the adaptation of conduct in a human community, and that with any markedly less degree of development than this he will require supervision and control and will be legally mentally deficient.

I say 'markedly' advisedly, for it is clear that with a slightly less degree of intelligence than *Level 3*, whilst an individual might be unable to survive unaided in any ordinary stratum of society, he might be able to do so in a backwater and under especially favourable conditions. There are, for instance, many persons in this country who get along fairly well in some simple routine occupation in which they are removed from the competition of the labour market and are treated with a little indulgence, but who speedily reveal their incompetence when called upon to shift entirely for themselves or when faced with circumstances outside the range of their previous experience. Their mental defect, which was previously latent, then becomes patent, and their success or failure is clearly dependent upon the nature of their environment. Persons of this type are often spoken of as 'borderlanders'. I think, however, that they are really mentally deficient, although their defect may not attract attention, and the necessity for dealing with them under the Act may not arise until the force of circumstances takes them out of their special environment. Many persons of this kind were doing tolerably well on the land, or in some menial occupation, until they were enlisted into the Army during the recent war: their defect then soon became obvious. I am also of the opinion that these persons form a very considerable proportion of our pauper population and of the 'ins and outs' of workhouses.

We have regarded the complex psychological function designated 'Wisdom' as divisible into the three separate processes numbered in the diagram (4) deliberation, discrimination, and reasoning, (5) volition and resolution, and (6) prudence, planning, and inventiveness: it is of interest to ask whether we can in certain cases point to a defect specially incident upon any one of these processes as being responsible for that social incapacity which is the criterion of legal mental defect. I think that in certain persons suffering from a mild grade of defect we can do so. I have examined many individuals who are not markedly deficient in either perception or feeling, who are not educationally very

backward, and not greatly, if at all, lacking in moral sense, and in whom psychological tests reveal a fair degree of discrimination, reasoning, and planning ability, and yet they are so emotional and unstable, so readily distracted by every chance word and happening, so lacking in purpose, that they are utterly incapable of settling down to, and following, a definite course, and in consequence they drift aimlessly through life like a rudderless barque. I believe the special defect here to be one of volition; although such persons may know the right course to take, they are inherently incapable of focusing consciousness sufficiently upon the idea of this to overcome instinctive tendencies and the distractions of the moment, and they consequently cannot consistently follow this course. Cases of this kind are not usually regarded as mentally defective, and their seeming intelligence and educational acquirements would undoubtedly cause great difficulty in certifying them. They are often spoken of as suffering from 'mental instability', 'lack of control', defective 'character' or 'temperament': but the condition is clearly due to a psychological abnormality, and if this has existed from birth and is permanent they would seem to come within the statutory definition, since they are certainly in need of supervision and control. In other cases there would not appear to be any defect of volition, but there is either little ability to compare ideas and to reason, or an absence of ability to look ahead and to make plans for eventualities, and such defects may similarly lead to marked social disability.

These general considerations, together with observation of the conduct of defectives, enable us to represent the different mental types and the various grades of aments diagrammatically, and I have endeavoured to do this in *Figs. 2 to 7*.

*Fig. 2* represents the subnormal type: in this there is a general and uniform imperfection of development of all the processes of mind, so that the individual stands on the psychological level of primitive social man. Such a person has capacity for thought, but practically no learning; he has feelings and emotions, but is defective in the higher sentiments; he has sufficient intelligence to adapt his actions to his simple environment, but is too defective in wisdom to do more than just hold his own in this environment. He is not mentally defective from the legal aspect, but he necessarily inhabits the lowest stratum of a civilized community.

*Fig. 3* represents that not rare class of moral, conscientious, learned fools. The capacities for learning and sentiment have a development equal to that of civilized man, but the apperceptive faculties are on the level of primitive man. There is consequently sufficient intelligence to adapt conduct to the moment and the

immediate future, but little ability to foresee and provide against remote contingencies. They are not usually legally mentally defective.

*Fig. 4* represents an equally prevalent type, that of the man who is unlearned and unemotional, but who has plenty of common sense; he is often highly successful in exploiting the learning of others.

*Fig. 5* represents the type which I have called the potential criminal. He has capacity for learning, wisdom, and perhaps an æsthetic sense equal to those of civilized man, but he is decidedly deficient in the moral and usually, but not always, the religious sentiments. He will commit a crime if he thinks there is no fear of detection, but he does not commit crimes which are likely to be discovered, because he realizes that such would be to his disadvantage. He may be a successful financier or man of business.

*Fig. 6* represents three grades of legal mental deficiency. The lowest grade of all, that which is known as absolute, complete, or profound idiocy, corresponds with *Level 1*. Persons of this severe grade of defect are incapable of thought, feeling, or will; their existence is entirely a vegetative one, such movements as they make are purely reflex and instinctive, and some of the primary instincts, such as sucking and propagation, are often lacking. Immediately above this grade is one slightly less defective known as partial or incomplete idiocy, and this merges into the lowest stratum of *Level 2*. The members of this group are capable of very elementary percepts, feelings, desires, and volition; but their appreciation of their surroundings and their intelligence are so defective that they are incapable of guarding themselves from the common physical dangers which threaten existence.

The imbeciles, as a class, correspond to *Level 2*, although the higher members merge into *Level 3*. They are capable of forming simple percepts and concepts, but they are practically devoid of any capacity for abstract ideation or appreciation of symbols, and they are unable to make any progress in learning. They are capable of feeling and of the simple primary emotions, but have neither æsthetic, social, nor religious sentiments. They have desire and will, and can, to some extent, adapt their actions to the requirements of the moment; but their attention is mainly passive, they cannot reason, they cannot form a mental image of the consequences of their acts, they cannot make plans, and they cannot inhibit their instinctive impulses. These defects result in an inability to perform work other than of a very simple routine character to which they have become habituated, and to "manage themselves and their affairs".

The lowest members of the feeble-minded grade correspond in the main with *Level 3*; there is, however, one important difference.

They have some capacity for thought, for forming simple abstract ideas, and for the appreciation of symbols, and consequently they can usually be taught to do simple reading, writing, and summing. They are capable of feeling and of the simple emotions, and have religious, social, and æsthetic sentiments in an elementary degree. But—and this is where they differ from *Level 3*—their apperceptive functions are not developed to a similar extent: whilst they have volition, they are defective in the power of comparing ideas and of forming judgements, and they have little ability to foresee the consequences of their actions and thus to make plans for even the immediate future. This defect of intelligence constitutes a very important difference between, on the one hand, the feeble-minded, and, on the other hand, primitive social man and the merely subnormal type. These two latter are able to maintain existence without supervision and to hold their own in a primitive community or a low stratum of civilized society: but I am of the opinion that the defect of the feeble-minded person is such that he would be incapable of existing without some control or supervision in any level or stage of human society. I do not here intend to enter into the question of the causation of mental defect: but I may remark that it is on account of this difference, and this marked relative deficiency of the apperceptive faculties, that I am unable to accept the view that mental defect is due to atavism: that is to say, that it is merely a harking back to a previous stage in the normal evolution of the race. It seems to me that in mental defect we have not a general evolutionary failure, but one which is incident especially upon the apperceptive processes of mind: it may even be confined to these in the milder grades of feeble-mindedness, and I am of the opinion that this is the essential psychological basis of legal mental defect. This selective defect results in an irregularity and disharmony of mental action which is very characteristic of this condition: it is very difficult to imagine that it can represent a normal stage in the evolution of the race, and I think the more likely explanation is that the defect is pathological.

The mildest degree of mental defect is that known as high-grade feeble-mindedness, and while the majority of the members of this class resemble those of the preceding in the fact that their intelligence does not come up to that possessed by primitive social man, they stand above them in that they have a relatively greater development of the capacities for thought and feeling. It may occasionally happen for one of the perceptive processes to be developed to an even extraordinary extent, and this is more often the case with that concerned in symbolic perception. We then have a variety of '*idiot savant*', such, for instance, as a calculating genius or an expert pianist. Generally,



however, while the high-grade feeble-minded can make some progress in school, their educational acquirements fall decidedly below those of the normal person of *Level 4*. The same is the case with regard to feeling; in some instances the æsthetic and religious sentiments are quite up to the average standard of *Level 4*; it may, indeed, happen for the æsthetic sense to be developed beyond the average of this level, producing an artistic genius; but generally the feeling processes are below the average of civilized man. Whilst the apperceptive faculties as a rule show a uniform defect of development, it is in these cases of high-grade feeble-mindedness that we not infrequently find the condition to which I have already referred, namely, a much greater incidence of the defect, or even its limitation to one particular process of the apperceptive group.

The fourth class of mental defectives recognized and defined by the Act, namely, moral imbeciles, are represented by *Fig. 7*. In these persons the perceptive faculties are up to, and even beyond, the average of civilized mankind, and in consequence they not only show none of the educational backwardness of the ordinary feeble-minded person, but they may have a high degree of learning. Their essential characteristic is a defect in the processes of apperception and feeling. With regard to the former, they are not only devoid of wisdom, but their intelligence is less than that possessed by primitive man, and the defect seems to be specially marked in the processes of discrimination and foresight. With regard to feeling, whilst they are capable of the complex emotions, there is a marked defect of the sentiments, which fall below those present at *Level 3*, the defect being particularly marked in the social sense. It is obvious that the facts that the functions of thought and learning are of normal development in these persons, that they are well educated and able to hold their own in conversation, result in their having very little clinical resemblance to ordinary mental defectives, and consequently their diagnosis and certification often present very great difficulties. I have recently dealt more fully with this condition elsewhere\*; but I may here remark that whilst real moral imbecility is not, according to my experience, the common condition that some persons would claim, and is apt to be closely simulated by temporary disorder of the regulating faculties, especially during the period of adolescence, there is not the slightest doubt that it has a very real existence, and that persons so affected are very dangerous and incurable criminals.

In conclusion, I would like to say that although the necessity

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\* *Proc. Roy. Soc. Med.*, 1921, xiv, April.

for brevity has compelled me to make somewhat dogmatic statements, it is far from my intention to dogmatize on this subject. The division which has been made of the various mental functions is purely tentative, and this, together with the diagrams, is merely an attempt to picture the nature of mental defect and its relationship to normal variations.

## A COMPARATIVE STUDY OF THREE COLLOIDAL REACTIONS ON THE CEREBROSPINAL FLUID.

BY D. O. RIDDEL AND R. M. STEWART, WHITTINGHAM.

THE colloidal-gold reaction introduced by Lange in 1912 is now generally accepted as one of the most important laboratory procedures in the examination of the cerebrospinal fluid. In neuro-syphilis it gives results which rival in value those of the Wassermann reaction, and its employment as a diagnostic aid in many non-syphilitic diseases has a wide sphere of utility which even at the present day does not appear to be fully appreciated.

Although the difficulties which at first surrounded the preparation of the reagent have now been largely overcome, there is still an element of uncertainty in its manufacture which cannot be altogether explained by failure to obtain a perfectly neutral solution. It occasionally happens that an apparently good reagent, fulfilling all the standard requirements laid down by Miller and his associates,<sup>1</sup> behaves in an irregular and mystifying manner, and, when such a misfortune arises, the worker must perforce reject his results and repeat from the beginning the rather laborious preparation of a new stock of solution. With a view to eliminating the risk of failure which attends the preparation of a solution of colloidal gold, proposals have been made to substitute other colloidal solutions which do not require the absolute purity of reagents and glassware which is so essential in Lange's test. It is perhaps too early to place much reliance on the trustworthiness of these modifications; but, judging from the few papers which have appeared, there seems to be a definite consensus of opinion that the colloidal tests in which gum mastic and benzoin are employed show a degree of parallelism to the gold test sufficiently close to justify their more extended use. One of the difficulties met with in attempting to appraise the value of these new tests is that few workers have carried out comparative tests, and in this country only Lange's reaction appears to have attracted attention. We have therefore thought it desirable to present the results of a short comparative study of the gold, the gum-mastic, and the colloidal-benzoin reactions, together with certain observations which may prove of interest to those performing these tests.

**Material.**—The comparative curves presented in this paper are 100 in number. The spinal fluids were obtained from asylum inmates, and, since the reactions with which we are here concerned find their greatest application in neuro-syphilis, a relatively large percentage of general paralytics have been included. None of the patients had received antisyphilitic treatment prior to examination of their fluids.

**Technique.**

*The Colloidal-Gold Reagent* was prepared according to the standard method of Miller, Brush, Hammers, and Felton. Each fresh batch of reagent was tested with the spinal fluid of a known general paralytic, and the test was performed in the usual manner. All fluids were examined within a few hours of their withdrawal.

*The Colloidal-Mastic Test* of Emmanuel was employed in the manner modified by Cutting,<sup>2</sup> using Smith's<sup>3</sup> numerical scale to denote degrees of flocculation and precipitation. The emulsion was prepared from the stock solution (10 gm. gum mastic in 100 c.c. absolute alcohol) by diluting 1 c.c. of the latter with 9 c.c. of absolute alcohol: 40 c.c. of distilled water were placed in a small flask, and the diluted mastic solution rapidly added and mixed by rotation. To the first of eleven small test tubes ( $3\frac{1}{2}$  in.  $\times$   $\frac{1}{2}$  in.) there was added 1.5 c.c. of a salt solution containing 99 c.c. of 1.25 per cent sodium chloride plus 1 c.c. of 0.5 per cent potassium carbonate, and to each of the remainder 1 c.c. of the same solution: 0.5 c.c. of cerebrospinal fluid was next added to the first tube, and, after mixing, 1 c.c. transferred to the second tube, and so on to the tenth tube: from this 1 c.c. was rejected, the eleventh tube thus serving as a control. Finally, to each of the eleven tubes 1 c.c. of the mastic solution was added. The tubes were allowed to stand for twelve hours at room temperature and the results then read.

*The Colloidal-Benzoin Test* of Guillain, Laroche, and Lechelle<sup>4</sup> is carried out as follows: Two stock solutions are prepared, one containing 0.01 per cent chemically pure sodium chloride, and the other a suspension of benzoïn resin. One gramme of benzoïn resin is dissolved in 10 c.c. of absolute alcohol, and after the lapse of forty-eight hours the supernatant fluid is decanted: of this, 0.3 c.c. is added drop by drop to 20 c.c. of distilled water, and the emulsion then heated to 35° C. in order to obtain a homogeneous suspension. The dilutions are carried out as follows: Sixteen small test tubes are set up in a rack: in the first tube there is placed 0.25 c.c. of the saline solution, in the second 0.5 c.c., and in the third 1.5 c.c.: each of the remaining tubes receives 1 c.c. of the same solution. Cerebrospinal fluid is next added: 0.75 c.c. to the first tube, 0.5 c.c. to the second and third tubes. From the latter, after mixing, 1 c.c. is transferred to the fourth tube, and so on until the fifteenth tube is reached. The cubic centi-

metre from it is rejected, the sixteenth tube thus acting as a control. Lastly, to each of the sixteen tubes 1 c.c. of benzoïn solution is added. The dilutions obtained are thus in geometrical progression, and range from 1-2 in the second tube to 1-16.384 in the fifteenth tube.

#### Graphic Representation.—

*Gold-Sol Test.*—In recording results the numeral 5 is used to indicate complete precipitation, and the lesser values to designate the graduated colour changes in the tubes where partial precipitation has occurred. In positive reactions precipitation always begins in tubes 3 and 4, and the tubes must be allowed to stand for twelve hours before the results are read.

A negative reaction is shown by an absence of colour change in all the tubes. The so-called paretic curve shows complete precipitation in the first few tubes, giving a colourless solution, with lesser changes in the remaining tubes. A typical paretic curve gives the following reading: 5555543100 (*Fig. 1*), but less marked precipitation may also be accepted where the general conformation of the curve

#### LANGE GOLD-SOL TEST.

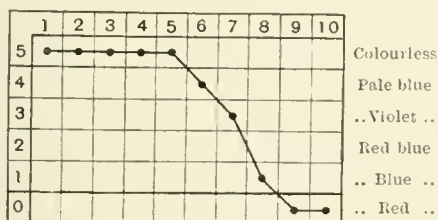


FIG. 1.—Paretic curve.

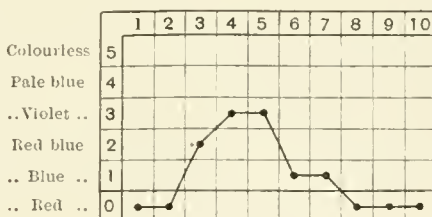


FIG. 2.—Syphilitic curve.

is preserved: thus, a reading 44443210 is still fairly typical. In general it may be said that where reduction in the first three or more tubes is well marked it may be considered a paretic curve. The syphilitic curve shows a complete absence of precipitation in the first one or two tubes, with the maximum colour change (usually violet and seldom beyond pale blue) in the fourth or fifth tube. A typical curve would be 0023311000 (*Fig. 2*), and usually tabes dorsalis and cerebrospinal syphilis conform to this type.

*Gum-Mastic Test.*—The maximum change in this test is indicated by 4 (Smith's scale), and the lesser numerical values differ proportionately. A negative result is indicated by a total absence of precipitation in all the tubes, and a paretic curve is shown by complete precipitation in the first three or more tubes: 444431000 (*Fig. 3*); but lesser degrees of precipitation may still be accepted provided the general conformation is preserved.

With regard to the syphilitic curve, the gum-mastic test does not appear to give any constant reading, and in this respect is much



inferior to the gold-sol test. In meningo-vascular syphilis, partial precipitation usually occurs in the first three or four tubes, but the first tube not infrequently remains unaltered. A curve such as 1332000000 (*Fig. 4*) might be interpreted as syphilitic or tabetic, but the wide variations encountered do not permit of a definite ruling on this point.

#### COLLOIDAL-MASTIC TEST.

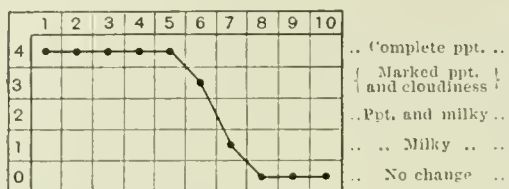


FIG. 3.—Paretic curve.

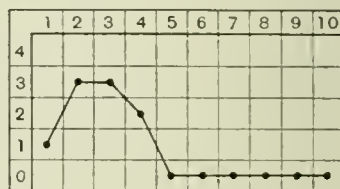


FIG. 4.—Syphilitic curve.

*The Colloidal-Benzoin Test.*—A negative reaction is indicated on a vertical line by the figure 0; 1 indicates a weak positive where the fluid remains cloudy but shows precipitation; 2 indicates a positive reaction where precipitation is complete. The tubes are allowed to remain at room temperature for six hours before the results are read. As in the other tests, a negative result is shown by an absence of change in the fifteen tubes.

#### COLLOIDAL-BENZOIN TEST.

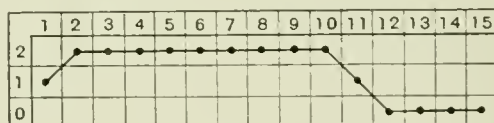


FIG. 5.—Paretic curve.

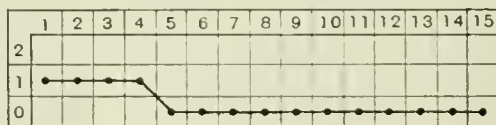


FIG. 6.—Syphilitic curve.

In their description of this test the authors recorded their results as positive or negative, no tables being provided to show the degrees of precipitation in positive reactions. They state that a paretic benzoin curve shows precipitation in the first nine or occasionally thirteen tubes. Apparently it is not essential that reduction should be absolute in all nine tubes, and the number showing complete precipitation may be increased or decreased somewhat without altering the interpretation. Duhot and Crampon<sup>5</sup> regard as positive a reaction in which precipitation occurs in the first four tubes. In our series

we have accepted as paretic a curve in which precipitation is complete or almost complete in five out of the first six tubes (*Fig. 5*).

A syphilitic curve is indicated by a partial precipitation in tubes 1 to 3 or 4 (*Fig. 6*).

*Limiting Factors in the Three Tests.*—In all three tests cerebrospinal fluid which has been standing for some time will give curves differing from those made with fresh fluid. This effect is least noticeable with the colloidal-gold solution, and in this test fluids kept at room temperature may be used up to forty-eight hours after withdrawal. Blood-contaminated fluids introduce serious errors in interpretation and should not be employed. In the case of Lange's test, spinal fluid containing blood in macroscopic quantities may give reactions in the luetic zone, and in the other two tests blood-admixture gives rise to irregular curves. The colloidal-gold reaction may be performed with old solutions, provided they have been kept well corked in a dark cupboard. The colloidal solutions of mastic and benzoin require to be freshly prepared: those older than a few days give unsatisfactory results. It may also be mentioned here that not every sample of gum mastic appears suitable for the test, but we have found samples of ordinary commercial benzoin resin quite satisfactory.

**Results of Authors' Tests.** In the following analysis we have grouped the cases for purposes of study under the following divisions: (1) Dementia paralytica; (2) Tabes dorsalis; (3) Cerebrospinal syphilis; (4) Disseminated sclerosis; (5) Non-syphilitic disease of the nervous system; (6) Miscellaneous.

Wassermann tests were performed only where the clinical diagnosis was in doubt or in cases in which the colloidal tests suggested an unsuspected syphilitic involvement of the nervous system.\* For determining the presence or absence of globulin in the spinal fluid, reliance was placed on the Ross-Jones and Pandy tests. For the cell count the method described by Bybee and Lorenz<sup>6</sup> was employed.

1. *General Paralysis (Table I).*—The spinal fluids of 30 cases of general paralysis were examined, and all three tests yielded typical curves in 28 instances. In the remaining 2 cases, which presented well-marked physical signs, the gold and benzoin tests were positive, and the mastic negative or atypical. The complete uniformity of the gold and benzoin reactions was very striking, and suggests that they are probably of equal value in the diagnosis of dementia paralytica. On the other hand, a paretic gold curve was obtained in four fluids taken from patients presenting no symptoms of general paralysis.

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\* The Wassermann reactions were performed at the City Laboratories, Liverpool, under the direction of Professor J. M. Beattie.

The first case was a demented female, 70 years old, who had suffered from a peripheral neuritis affecting the legs in 1916. Her blood and spinal fluid Wassermann were both negative. The second patient, although diagnosed general paralysis on admission, and in several other institutions, was unquestionably a case of disseminated sclerosis. He gave a negative Wassermann reaction in both blood and cerebrospinal fluid. The remaining fluids were from two cases of tabes, and in both the Wassermann reaction was strongly positive in the cerebrospinal fluid. The mental state of the first had been one of delusional insanity for nine years, and there was nothing to suggest an associated syphilitic involvement of the brain. The second case was one of progressive tabes with melancholia.

The gum-mastic reaction gave paretic curves in two non-syphilitic fluids—the chronic demented patient, and the case of disseminated sclerosis. The colloidal-benzoin reaction gave no paretic curves in non-syphilitic cases. From this brief analysis it is seen that in no instance were there paretic mastic and benzoin curves with a negative gold curve, and that, although the gold and mastic tests gave paretic curves in disseminated sclerosis, the benzoin reaction failed to do so.

It is not a little remarkable that in one instance two reactions gave paretic curves in the absence of other positive laboratory findings or clinical manifestations of syphilis. The patient was a woman, age 71, in an advanced stage of dementia; alcohol was the supposed cause of her insanity, and in 1916 she developed peripheral neuritis affecting the legs, which left them permanently paralyzed in a state of talipes equinus.

*Tabes Dorsalis* (Table 2).—The 3 cases that were diagnosed tabes dorsalis presented well-marked signs and symptoms of the disease. The mastic and benzoin tests gave syphilitic curves in the three fluids, but the colloidal-gold reaction gave in two instances paretic curves to which reference has already been made; in the other fluid a well-marked syphilitic curve was obtained.

*Cerebrospinal Syphilis* (Table 3).—The colloidal-gold reaction gave curves in the syphilitic zone in all 6 cases; the mastic test also gave curves which were interpreted as syphilitic. The colloidal-benzoin test showed syphilitic curves in 4 cases and negative in two fluids. The Wassermann reaction proved positive in 5 cases and negative in the sixth. We have included the latter case in the cerebrospinal group because the clinical history and physical state of the patient pointed clearly to a syphilitic infection of the nervous system. He contracted syphilis when 22 years of age, and had a transient attack of hemiplegia four years later. A mild dementia supervened, and he is now in his thirty-seventh year. Although both the Wassermann and

benzoin reactions are negative, it is probable that the positive gold curve is the more correct index of his condition.

*Syphilitic Curves in Non-syphilitic Disease (Table 3a).—*1. A primary dement with symmetrical wasting of the hands and slight spastic paresis of the lower limbs gave a syphilitic type of curve with the colloidal-gold solution, and negative results in the mastie and benzoin tests (Wassermann —, cells 4, globulin faintly +).

2. A patient with chronic tuberculous adenitis and recent symmetrical swelling of the parotid glands gave negative gold and benzoin curves and a positive mastie curve (Wassermann —, cells 6, globulin faintly +).

3. One case of insanity with epilepsy gave a syphilitic gold curve, slight reduction in the mastie test, and a negative colloidal benzoin reaction (Wassermann —, cells 0, globulin —).

4. In a case of confusional insanity the colloidal-gold reaction showed reduction in the syphilitic zone, a mastie curve which was interpreted as syphilitic, and a negative colloidal-benzoin reaction (Wassermann —, cells 8, globulin —).

The above four cases form too small a group on which to base any conclusions, but the parallelism between the Wassermann reaction and benzoin test is certainly noteworthy.

*Disseminated Sclerosis (Table 4).—*The first case gave syphilitic curves in all three reactions. The spinal fluid of the second case, to whom reference has already been made, showed a paretic curve in the gold and mastie tests, and a syphilitic curve in the benzoin test.

*Organic Nervous Diseases (Table 5).—*With two exceptions all three tests were negative. A patient suffering from pseudobulbar paralysis showed very slight reduction in the middle zone in the colloidal-gold test, slight reduction in the first two tubes of the mastie test, and a negative colloidal-benzoin reaction (Wassermann —, cells 4, globulin faintly +). In another patient suffering from paraplegia the gold test was negative, the mastie showed slight reduction in the first five tubes, and the benzoin test was negative (Wassermann —, cells 10, globulin faintly +).

*Miscellaneous (Table 6).—*A survey of this group shows that no positive results were obtained.

*Relation of the Globulin Content and Cell Count to the Three Reactions.*—In 30 cases of dementia paralytica, positive colloidal reactions were in all instances associated with pleocytosis and increased globulin content; but on the other hand, in 12 cases in which all three tests were negative there was a definite increase in globulin, and in 13 cases giving negative results the cell-count was increased. One fluid with no increase of globulin gave paretic curves in the colloidal-gold and gum-mastie tests, and in one case of dementia in whom all three tests

were positive the globulin content was within normal limits. In only one instance did we find all three reactions negative in a spinal fluid which showed a positive Wassermann reaction, pleocytosis, and increase of globulin. In other words, the three colloidal reactions failed to give evidence of a syphilitic infection in 1 per cent of the series. The patient was a woman with gummatous ulceration of the soft palate, and curiously enough her blood Wassermann was negative.

Table 1.—*General Paralysis.*

Case No.	Diagnosis	Cells per cmm.	Globulin Content	Colloidal-Gold reaction	Mastic reaction	Colloidal-Benzoin reaction	Wassermann reaction CS, F, Bld
1	G.P.I. .. ..	98	- -	5555555543	4444200000	1222221122210000	
2	G.P.I. .. ..	110	- -	5555543200	4443000000	1222222222200000	
3	G.P.I. .. ..	68	- -	5555544444	4444433200	2222220000222200	
4	G.P.I. .. ..	184	- -	5555555554	4444321100	2222200022222220	
5	G.P.I. .. ..	120	++	5555555443	4444430000	2222220022222200	
6	G.P.I. .. ..	30	- -	5544432220	4332200000	2222222222222200	
7	G.P.I. .. ..	64	- -	5555555554	4443232100	2222222222220000	
8	G.P.I. .. ..	86	- -	5555443332	4423210000	2222222222222000	
9	G.P.I. .. ..	58	- -	5555555543	4444432210	222222001222210	
10	G.P.I. .. ..	-	-	5544443110	4443210000	1222222222222100	
11	G.P.I. .. ..	82	+	5555454333	4443210000	2222222222221111	
12	G.P.I. .. ..	32	-	4444442100	4444432100	1222222222222200	
13	G.P.I. .. ..	18	-	4444443000	4444200000	2222222210000000	
14	G.P.I. .. ..	12	-	4443332000	4443222100	1222222200000000	
15	G.P.I. .. ..	20	-	4444430000	4444000000	2222222222221100	
16	G.P.I. .. ..	12	-	4444332000	4431110000	2222102210000000	
17	G.P.I. .. ..	292	++	5555543434	4444433200	2222220022210000	
18	G.P.I. .. ..	264	+	5554434220	4444321000	1222222222220000	
19	G.P.I. .. ..	38	-	5555432000	4444433200	2222220122200000	
20	G.P.I. .. ..	38	+	5553333210	4443310000	1222222220000000	
21	G.P.I. .. ..	22	-	5555443200	4444211000	2222222220000000	
22	G.P.I. .. ..	70	-	5553333310	4444422000	2222222222000000	
23	G.P.I. .. ..	14	+	5555544200	4444431111	1222222222000000	
24	G.P.I. .. ..	14	-	5554443221	4444432111	2222222221000000	
25	G.P.I. .. ..	182	-	5555555432	0444444330	2222221122000000	
26	G.P.I. .. ..	16	++	5555555432	3444444443	2222222222210000	
27	G.P.I. .. ..	48	++	5555543000	4444433211	1222222222220000	
28	G.P.I. .. ..	34	-	5555543100	4444443333	2222222222200000	
29	G.P.I. .. ..	30	-	5443322000	4433333222	2222211200000000	
30	G.P.I. .. ..	54	-	5544430000	4444321000	1222122210000000	+

Table 2.—*Tabes Dorsalis.*

31	Tabes dorsalis ..	60	+	4443322000	4322000000	0122002221000000	+	+
32	Tabes dorsalis ..	6	++	4433310000	3332000000	1111022221000000	+	+
33	Tabes dorsalis ..	4	-	4133311000	2332100000	1111142200000000	+	

Table 3.—*Cerebrospinal Syphilis.*

34	Cerebellar ataxia, congenital syphilis	54	-	0000333000	3322000000	1111121122210000	+	
35	Syph. hemiparesis	—	-	0002332000	3210000000	0000002222000000	-	
36	Syph. hemiplegia	4	+	1112330000	3332221100	0000002220000000	-	
37	Cerebral syphilis	8	-	1233300000	4322000000	1110022222000000	-	
38	Erb's syph. spinal sclerosis ..	32	-	1112233100	2344432100	0120022222100000	-	
39	Cerebral syphilis and gumma of palate ..	0	-	0002200000	3322100000	1111110000000000	-	



Table 3a.—*Syphilitic Curves in Non-syphilitic Disease.*

Case No.	Diagnosis	Cells per cmm.	Globulin Content	Colloidal-Gold reaction	Mastic reaction	Colloidal-Benzoin reaction	W'stmann reaction CS. F. B'4
40	Muscular atrophy —hands .. ..	4	—	0022210000	0000000000	000001222000000	—
41	Insanity with epilepsy .. ..	0	—	1122210000	3300000000	000000000000000	—
42	Confusional insanity	8	—	1123000000	4421002000	000002221100000	—
43	Tubercular adenitis	6	—	0023330000	3322110000	000002220000000	— —

Table 4.—*Disseminated Sclerosis.*

44	Disseminated sclerosis .. ..	0	—	5444321000	4443210000	111002220000000	— —
45	Disseminated sclerosis .. ..	4	—	1003444100	3320000000	111112222100000	— —

Table 5.—*Organic Nervous Diseases.*

46	Motor aphasia ..	15	—	0000000000	0000000000	000002220000000	
47	Pseudobulbar paralysis .. ..	1	—	0000111000	3200000000	000001222220000	—
48	Infantile cerebral paralysis .. ..	4	—	0000111100	0000000000	000002222220000	—
49	Spastic paralysis ..	6	—	0000000000	0000000000	000000211000000	
50	Hemiplegia .. ..	0	—	0000000000	0000000000	000000222220000	
51	Hemiplegia — epileptic imbecile ..	0	—	0000000000	0000000000	000000220000000	
52	Hemiplegia .. ..	2	—	0000000000	1111113111	000001222000000	
53	Paraplegia .. ..	0	—	0000000000	0000000000	000000211000000	
54	Triplegia (mitral stenosis) .. ..	2	—	0000000000	0000000000	000000210000000	
55	Hemiplegia and aphasia .. ..	2	—	0000000000	0000000000	000000200000000	
56	Hemiplegia .. ..	0	—	0011100000	3000000000	000000221000000	
57	Infantile poliomyelitis .. ..	0	—	0000000000	0000000000	000002220000000	
58	Facial hemispasm	10	—	0000000000	1110000000	000000010000000	—
59	Sclerosis of cord ..	4	—	0000000000	0000000000	000002222000000	—
60	Lead encephalopathy .. ..	0	—	0000000000	0000000000	000000122200000	
61	Optic atrophy .. ..	12	—	0000000000	0000000000	000000211100000	
62	Paraplegia .. ..	20	—	0000010000	2200000000	000002222200000	
63	Hemiplegia .. ..	0	—	0011110000	0000000000	000002222100000	

Table 6.—*Miscellaneous.*

64	Secondary dementia	0	—	4444442100	4443200000	000112222222220	
65	Idiocy .. ..	4	—	0000000000	3000000000	000000222220000	
66	Tertiary syphilis (nasal bones) ..	2	—	0000000000	0000000400	000000222200000	—
67	History of syphilis	0	—	0000000000	0000000000	000001222000000	—
68	History of syphilis	0	—	0000000000	0000000000	000002221000000	
69	Tertiary syphilis	8	—	0000000000	0000000000	000000111000000	—
70	Hypopituitarism ..	5	—	0000000000	0000000000	000000111000000	
71	Chronic uræmia ..	6	—	0000000000	0000000000	000000000000000	
72	Exophthalmic goitre	8	—	0000000000	0000000000	000002200000000	
73	Pellagra .. ..	34	—	0000000000	0000000000	000012100000000	
74	Secondary Dementia	18	—	0000000000	0000002202	000001100000000	
75 to 84	Cases of primary dementia ..	2	—	0000000000	0000000000	000000222000000	
85 to 91	Insanity with epilepsy .. ..	2	—	0000000000	0000000000	000000222100000	
92	Confusional insanity	6	—	0011100000	0000430000	000000010000000	
93	Confusional insanity	6	—	0011100000	3310000000	000000221000000	
94 to 100	Various psychoses	2	—	0000000000	0000000000	000000222100000	

**General Discussion.**—The types of curve which we obtained when employing the colloidal-gold reaction appeared to follow exactly those which have been described by previous writers. The types of colour change in the various dilutions are certainly of great diagnostic value, but they are not specific for any one condition. A paretic curve was a constant finding in all the spinal fluids taken from general paralytics, but we also obtained four paretic curves in patients who were not suffering from general paralysis. Furthermore, in one advanced case (*Case 30*) of this disease a negative colloidal-gold reaction was obtained on the first examination of his spinal fluid; when a second examination was made six days later the curve was irregular, and only on the final examination made one month later was there a typical curve. This failure to obtain constant results cannot have been due to faulty solutions of colloidal gold, for the various samples used gave typical curves with other paretic fluids. Other writers have noted this peculiarity, and by some it has been attributed to the provocative effects of lumbar puncture which may determine an altered physico-chemical relation in the globulin of the cerebrospinal fluid.

The gum-mastic reaction has proved in our hands to be less sensitive than Lange's test and of less diagnostic value; but the possibility of technical error seems small, and readings may be rapidly obtained. Against this advantage must be placed the failure to obtain with any degree of constancy curves which could be interpreted as syphilitic.

From a study of 100 spinal fluids, E. Duhot and P. Crampon<sup>5</sup> conclude that the colloidal-benzoin reaction is negative in non-syphilitic lesions of the nervous system, and positive in 90 per cent of cases of neurosyphilis. In our series the colloidal-benzoin test was positive in every case of general paralysis, and we did not obtain a paretic curve in any case of an obviously non-syphilitic character. In two cases of disseminated sclerosis the type of curve was syphilitic, and with these two exceptions the reaction appeared specific for neurosyphilis. The results were therefore not only in close agreement with those of the colloidal-gold reaction, but in some respects of greater diagnostic value.

When we came to chart the precipitation curves in the benzoin reaction we were at once impressed by the irregular behaviour of many fluids. Indeed, at first glance the test seemed to possess no value, for the presence of varying degrees of precipitation in one or more tubes was an almost constant finding with normal fluids. Thus, in a miscellaneous group of 35 normal spinal fluids the benzoin reaction showed a complete absence of precipitation in the whole 15 tubes in only two instances, a very different finding from the 27 entirely

negative gold reactions in the same series. However, on carrying our analysis a little further it became evident that this precipitation occurred almost constantly in the middle series, and with one exception was never found in the first five or six tubes. Another peculiarity was the incompleteness of precipitation in tube 1, even when reduction was pronounced in nearly all the remaining tubes of the series. The method of Guillain, Laroche, and Lechelle seemed, therefore, to stand in need of modification; but, by restricting the number of dilutions employed to five, we were able to obtain reliable information without altering the strength of the salt solution. Furthermore, the omission of the first tube of the series reduced the quantity of cerebrospinal fluid required for the test by nearly one-half. The benzoin curves in our tables were obtained by employing the original method; but, in the modification proposed, the dilution of cerebrospinal fluid in the first tube is 1 in 2, and is carried only as far as the fifth tube, the sixth serving as a control.\* In the original method of Emanuel<sup>7</sup> the mastie test was performed with five tubes, and since neither reaction appears to give positive results in cases of meningitis (non-syphilitic) we believe no advantage is obtained by using dilutions higher than 1 in 32.

Guillain and his associates recommend the use of the ultra-microscope for examining the benzoin reaction in its early stages. When the reaction is positive there is an immediate arrest of Brownian movement in the resinous suspension, followed by the appearance of a mass of refractile granules which agglutinate. We have found

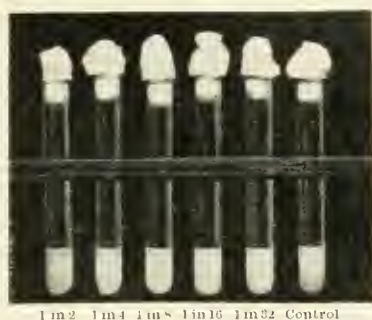


FIG. 7.—Colloidal-benzoin reaction (modified). (a) *Negative curve.*

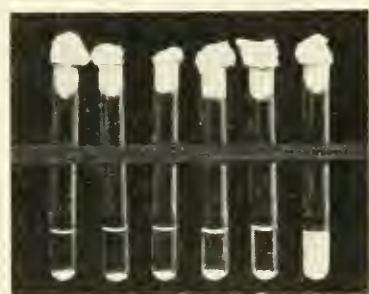


FIG. 8.—Colloidal-benzoin reaction (modified). (b) *Partic curve.*

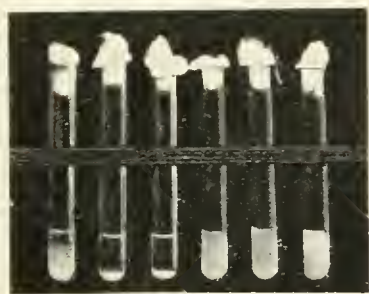


FIG. 9.—Colloidal-benzoin reaction (modified). (c) *Syphilitic curve.*

\* Our investigation was complete before the appearance of a recent communication (*Presse médicale*, 1921, Sept. 28), in which Guillain, Laroche, and Lechelle describe a modification of their test, substantially the same as that outlined above.

that equally reliable information may be obtained by centrifuging the tubes for a few minutes. The control tube in a positive reaction shows no precipitation, and the degrees of reduction in the other tubes are strictly comparable with those obtained by the ordinary technique.

In this test the ease with which the degrees of precipitation may be read, the restriction to three numerals for designating these degrees, and the rapidity with which results can be obtained, may all be claimed as advantages which the colloidal-gold and gum-mastic reactions do not possess.

**Conclusions.**—1. In a comparative study of spinal fluids in 30 cases of general paralysis the gold-sol test and the colloidal-benzoin reaction of Guillain, Laroche, and Lechelle gave parallel results; the gum-mastic reaction was in less close agreement.

2. The colloidal-gold and the gum-mastic tests gave paretic curves in non-paretic fluids. The colloidal-benzoin test gave paretic curves only in paretic fluids.

3. Syphilitic curves were obtained in all three tests from cases that clinically were not examples of neurosyphilis.

4. In the colloidal-benzoin reaction a slight degree of precipitation in the middle series of tubes was often obtained with normal cerebro-spinal fluid.

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## THE PHYLOGENETIC SIGNIFICANCE OF THE PLANTAR RESPONSE IN MAN.

BY G. DE M. RUDOLF, LONDON.

### I.—INTRODUCTION.

THE significance of the Babinski reflex, or the extensor plantar response, has been very much discussed. Many theories have been formulated, some dealing with the phylogenetic side of the question, others with the physiological. One of the hypotheses based upon phylogenetic considerations states that the extensor plantar response signifies a reversion to the prehensile functions of the great toe of our arboreal ancestors.<sup>7, 17</sup> This is the theory most generally held by the supporters of the phylogenetic significance of the plantar response.

Physiologically, the normal adult flexor plantar response is generally held to be dependent upon the integrity of the crossed pyramidal tracts, and does not appear until myelination of the pyramidal fibres occurs. Both the normal infantile and the pathological extensor responses are believed to be parts of a defensive reflex. Sherrington's nociceptive flexion reflex of the whole limb.

With the object of endeavouring to determine what are the underlying fundamental principles of the plantar response, certain investigations, described below, were undertaken. These consisted of the examination of one part only of the plantar response, the movement of the great toe, in some of the lower animals and in British-born infants up to fourteen days old. In both classes the subjects examined were apparently healthy.

Although, in these investigations, the movement of the great toe was the only response studied, it must not be forgotten that this is but one part of the plantar response, for the entire reflex consists of movements of the whole limb and sometimes of the limb which is not stimulated as well. As, however, the movement of the great toe is that portion of the plantar response which is most used in clinical medicine, it is the most important part, from a practical standpoint, of the reflex.

The stimulation employed to invoke the response was effected by stroking the plantar surface of the foot from the heel in an anterior direction, using a pointed pencil, the finger-nail, or a pin. In the



case of one animal, the chimpanzee, stimuli of different strengths were used in order to discover whether the type of response varies with the pressure employed. The stimuli were produced by the use of strong and light pressure with the end of a pencil, and strong and light pressure with a straw. In each case an extensor response was obtained. This was, however, more marked with the heavier pressures, although it was quite definite with the lighter. As the chimpanzee has a thick layer of skin upon the sole of its foot, it appears that the thickness of the skin, and therefore the pressure employed, does not affect the nature of the response, but only the degree. This corresponds with the findings of Riddoch in complete transection of the cord in man,<sup>12</sup> for he noted that the greater the stimulus employed the greater was the response—up to a certain limit, of course.

If, however, the pressure used is very great and the stimulus is applied in the middle or medial part of the sole, a flexor plantar response is obtained, due to the pressure upon the plantar muscles approximating the central and distal ends of these structures and thus bending the toe downward. That this flexor movement of the great toe obtained with heavy pressure is not a true reflex action can be realized from the following experiment.

The plantar reflexes were examined in a man of about 25 years of age, fifteen minutes after death. The subject had apparently been healthy at the time of the accident. He had been riding a bicycle and his machine skidded; the wheel of a motor omnibus passed over his head, killing him instantaneously. It was found that when the sole of the foot was stimulated with light pressure no response of any description was obtained. On using heavier pressure, however, towards the medial part of the foot, the great toe flexed. This flexion was more gradual than that of a flexor plantar response, and it increased as the stimulating point approached the toe; thus clearly showing that a movement of plantar flexion of the great toe can be obtained, even in the absence of all reflex response, if sufficiently strong stimuli are employed.

In all the investigations the plantar response was taken to be the first movement of the great toe after the stimulus had been applied. Succeeding movements were not noted, as they are, in the majority of cases, of a voluntary nature. In some instances, however, it was very difficult to differentiate between a plantar flexion response and a dorsiflexion, or extension, movement, on account of the occurrence of voluntary movements. In the case of animals there was the added voluntary movement of grasping, which does not apparently occur to the same extent in the human baby. Sometimes it became necessary to hold the legs while the stimulus was being applied.

## II.—THE PLANTAR RESPONSE OF THE LOWER ANIMAL.

The following table shows the results obtained upon the animals examined.

Table I.

						Right Foot	Left Foot
CLASS—AMPHIBIA—							
i.	Common newt ( <i>Molge vulgaris</i> )	..	..	..	..	Nil	Nil
ii.	Common toad ( <i>Bufo vulgaris</i> )	..	..	..	..	Nil	Nil
iii.	Giant toad ( <i>Bufo marinus</i> )	..	..	..	..	Nil	Nil
iv.	Argentine horned frog ( <i>Ceratophrys ornata</i> )	..	..	..	..	Nil	Nil
v.	Edible frog ( <i>Rana esculenta</i> )	..	..	..	..	Nil	Nil
CLASS—REPTILIA—							
vi.	Tuatera ( <i>Sphenodon punctatus</i> )	..	..	..	..	Nil	Nil
vii.	Stump-tailed lizard ( <i>Trachysaurus rugosus</i> )	..	..	..	..	Nil	Nil
viii.	Cunningham's skink	..	..	..	..	Nil	Nil
ix.	Tiliqua	..	..	..	..	Nil	Nil
x.	Green lizard ( <i>Lacerta viridis</i> )	..	..	..	..	F.	F.
xi.	Chamaeleon	..	..	..	..	Nil	? F.
xii.	Gecko	..	..	..	..	F.	F.
xiii.	Alligator	..	..	..	..	Nil	Nil
xiv.	Crocodile	..	..	..	..	Nil	Nil
CLASS—MAMMALIA—							
a. Rodentia.							
xv.	Rabbit ( <i>Lepus cuniculus</i> )	..	..	..	..	Nil	Nil
xvi.	Guinea pig ( <i>Cavia</i> )	..	..	..	..	Nil	Nil
xvii.	Chipmunk ( <i>Tamias</i> )	..	..	..	..	Nil	Nil
b. Carnivora.							
xviii.	Mongoose ( <i>Helogale undulata</i> )	..	..	..	..	? F.	? F.
xix.	Mongoose, Indian ( <i>Herpestes mungo</i> )				No. 1	? F.	? F.
					No. 2	Nil	? F.
xx.	Fennec ( <i>Canis zerda</i> )	..	..	..	..	Nil	Nil
xxi.	Domestic Cat ( <i>Felis</i> )	..	..	..	No. 1	Nil	Nil
					No. 2	Nil	Nil
xxii.	Tayra ( <i>Galictis barbara</i> )	..	..	..	..	F.	F.
xxiii.	Kinkajou ( <i>Cercopithecus caudivolutus</i> )	..	..	..	..	F.	F.
c. Primates.							
xxiv.	Spider monkey ( <i>Ateles</i> )	..	..	..	No. 1	F.	E.
					No. 2	E.	E.
xxv.	Spider monkey, black-faced ( <i>Ateles ater</i> )	..	..	..	..	E.	E.
xxvi.	Bengal monkey ( <i>Macacus rhesus</i> )	..	..	..	..	Nil	E.
xxvii.	Black mangabey ( <i>Cercocebus</i> )	..	..	..	..	E.	E.
xxviii.	Burnett's monkey	..	..	..	..	E.	Not tested
xxix.	Chimpanzee ( <i>Anthropopithecus</i> )	..	..	..	..	E.	E.

[Note.—Nil = No response obtained. E. = Extensor or dorsiflexion.  
F. = Flexor or plantar flexion.]

Upon consideration of the above table, it will be seen that amongst the lower classes of the animal kingdom the plantar response is either absent or is flexor in type. No response at all was obtained in the amphibia, and amongst the reptilia only three creatures, the chameleon, the gecko, and the green lizard, gave responses, in each case flexor in character. There is doubt whether the response was present in the chameleon, although, if so, it was flexor. The absence of certainty in regard to the reflex in this creature is due to the nature of its feet; the toes are divided into two parts, three of them being united by a web and forming the outer half of the foot, the remaining two being also united and forming the inner part. Thus there is great difficulty in detecting any movement in the first toe.

Unfortunately amongst the mammalia there are comparatively few animals below the primates that are plantigrade. The great majority are digitigrade, walking on the phalanges with the metatarsus and tarsus raised above the ground. In the digitigrade animals a plantar response, obtained in the usual way, is not to be expected, even though the stimulus be applied over the metatarsus. This is what is found, for the guinea-pig, rabbit, fennec, and cat are digitigrade. It does not, however, necessarily follow that all plantigrade animals give a flexor plantar response, for the chipmunk is plantigrade; and the responses were so slight in the case of the mongooses that it was very difficult to be certain that the toes moved at all. There was no question of the response being extensor, but of there being any response. If there was one, it was flexor.

In the higher animals plantar reflexes were readily obtained. Corresponding with the previous observations of Collier,<sup>6</sup> all the monkeys gave extensor plantar responses, with the exception of one foot of one of the spider monkeys, and one foot of the Bengal monkey. In the case of the former the animal was endeavouring to withdraw its foot during the observations, thus necessitating holding the leg firmly. In the case of the Bengal monkey, the feet were very cold at the time of the observation, making the response difficult to obtain.<sup>6</sup> As will be seen from the table, the only member of the higher apes examined gave an extensor plantar response. This animal, a chimpanzee, was only 10 to 12 months old, and as chimpanzees of this age are able to walk readily if necessary—although, of course, the usual mode of progression is on the knuckles of the hands—it is not at all probable that the plantar response would change at a later period.

Thus the investigations described above point to the conclusion that the normal plantar response, if present, is of the plantar flexion type in the lower animals, whereas in the primates it is of the dorsiflexion, or extensor, variety.

### III.—THE PLANTAR RESPONSE OF THE HUMAN INFANT.

The investigations carried out upon the human infant consisted of the examination of the plantar response on a series of 101 children, all under 15 days old. It was thought that, if very young infants were examined, any hereditary relie which may pass away later might be detected, if present. The following were the results obtained:—

*Table II.*

Age in days	Total No. examined	Total No. giving flexor	Total No. giving extensor	Inde- terminate or doubtful
0 to 6 (incl.) .. ..	70	24	42	4
7 to 14 (incl.) .. ..	31	3	26	2

In the above table the cases in which the nature of the response was doubtful have been placed in a separate column.

In order to find the percentage of infants that gave an extensor response in the whole series, it is necessary to eliminate all the doubtful cases. When this is done it will be seen that in the series of 95 thus obtained, 69·5 per cent of infants gave an extensor plantar response, 30·5 per cent a flexor. Thus in the first fortnight of life just under one-third of all infants have a flexor plantar response. The total number of 95 infants examined is sufficient for an approximate generalization, for if Poisson's rule<sup>19</sup> for finding the possible maximum error be applied, it will be seen that, however great the series is, the percentage of infants giving a flexor plantar response could only vary between the limits of 33·05 per cent and 27·95 per cent, that is, within a range of 2·55 per cent.

If the gross figures be analyzed still further, and the percentage of infants giving flexor plantar responses during the first and then during the second week be noted, the percentage of flexor plantar responses is found to be greater during the first week than during the second. This agrees with the observations of Bersot<sup>3</sup>, who states that in very young infants a flexor plantar response is obtained.

*Table III.*

Age in days	No. examined	No. flexor	No. extensor	Flexor per cent
0 to 7 (incl.) .. ..	71	26	45	42·6
8 to 14 (incl.) .. ..	24	1	23	4·2

Now, in the first eight weeks after birth 92 per cent of infants give an extensor response: in the first year 77 per cent; and in the second and third year 5 per cent.<sup>11</sup> Cattaneo,<sup>5</sup> however, found that only 30 per cent of infants under the age of four months gave an extensor response. From the figures of Monrad-Krohn quoted first, on the other hand, it can be presumed that during the first eight weeks of life 8 per cent of infants give a flexor response: during the first year 23 per cent; and in the second and third year 95 per cent. Therefore it appears that during the first part of life a large number of flexor plantar responses are obtained. This number becomes steadily less, and then at a later period becomes greater and greater, giving place to the permanent flexor plantar response of the adult, or rather post-infant period, (*see Chart I*). The chart shows the very rapid decrease in the percentage number of flexor plantar

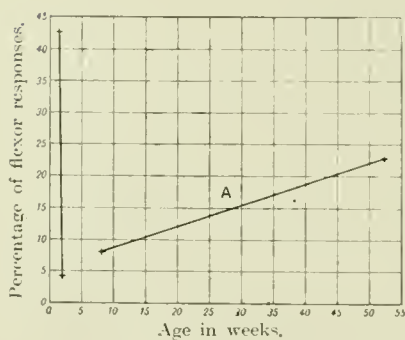


CHART I.

A Graph based on Monrad-Krohn's figures.

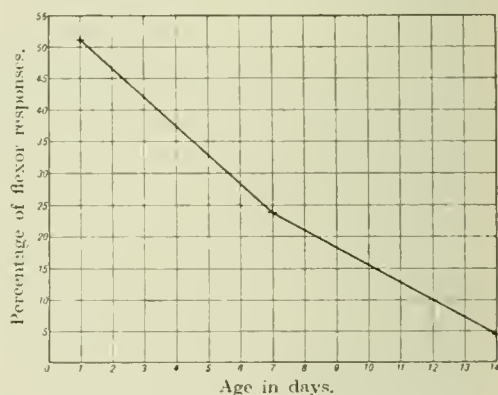


CHART II.

responses present in the first weeks of life. The gradients of the two lines should be compared, although, of course, the graph based upon the figures given by Monrad-Krohn includes infants of one and two weeks old, as this writer gives his first percentage upon infants up to eight weeks old.

On looking still more closely into the responses present during the first two weeks of life it will be seen that the flexor plantar response occurs mainly during the first twenty-four hours of life. Thirty-three infants were examined from birth up to 24 hours old; 38 from 24 hours old to the beginning of the eighth day; and 24 from the beginning of the eighth day to the end of the fourteenth. The results are given as a graph in *Chart II*, which shows that there is a uniform fall in the percentage of flexor plantar responses as the infant grows older.



In certain instances, the same infant was examined at different ages. In the majority of the infants examined, alterations in the plantar responses were not found. Some of the cases in the table below are, however, worth further consideration. Infants Nos. 1, 4, 5, and 6 show that a certain number of babies do not commence life with the the early flexor plantar response, or, as it might be termed, 'the infantile flexor response', in contradistinction to Collier's 'infantile response',<sup>6</sup> the extensor response of the older child. The total series of infants examined also shows that a number of babies commence life with an extensor plantar response. Infants Nos. 2, 3, and 4

Table IV.

No.	Sex	Age	Right	Left	Notes
1	Male	At birth	E	E	
		3 days	E	E	
2	Male	At birth	Nil	Nil	6 weeks premature.
		4 days	E	E	
		5 days	F	F	
3	Male	3 mins.	F	F	
		4 days	E	E	
		6 days	E	E	
4	Male	5 mins.	E	E	
		7 days	F	F	
5	Male	2 hours	E	E	
		11 days	E	E	
6	Male	1 day	E	E	
		2 days	E	E	
7	Male	2 days	E	E	
		3 days	E	E	
8	Female	6 days	E	E	
		7 days	E	E	

demonstrate the variability of the plantar response. No. 2 was born six weeks prematurely, and no plantar response was obtained on either foot. This child was the only one in the whole series of 101 that gave no response, and the suggestion is either that the reflex centres in the cord and the pyramidal tracts are not functioning in a 7½-months foetus, or else that the peripheral nerves in connection with these centres are not functioning at this period of the child's existence. This absence of plantar response as shown by the great toe corresponds with the observations of Bersot,<sup>3</sup> who found that in 4- to 5-month foetuses and in those of 27 to 28 weeks the big toe is generally motionless after plantar stimulation. Occasionally it moves in plantar flexion. In foetuses of 34 to 36 weeks, however, the same writer states that the response of the great toe is usually extensor,

although sometimes flexor. He also observes that the response in 30- to 32-weeks foetus is one of plantar flexion, being similar, he says, to that obtained immediately after birth. Unfortunately the author quoted gives neither percentages nor the total number of foetuses examined, but merely makes generalizations, based, presumably, upon his own observations.

The general condition of a premature baby at birth is another factor which suggests that the nervous system is not functioning fully, for the muscles have little or no tone, whereas in the full-time child these structures are firm. After birth, however, the reflexes must commence functioning almost at once, for within four days, in child No. 2, an extensor response was obtained, which became flexor on the fifth day. Evidently in this case the nervous system began to function very quickly, as if the sudden change from intra- to extra-uterine life stirred this system to unusual vigour, for the adult flexor

*Table I.*

No.	Sex	Age	Right	Left
1	M	2 days	? E	? E
	M	2 days	E	E
2	M	2 hours	E	E
	F	1 hr. 10 min.	E	E
3	M	$\frac{1}{2}$ hour	F	F
	F	$\frac{1}{2}$ hour	F	F

plantar response was present by the fifth day. No. 4 is similar to No. 2, only the child was not premature. In this case the adult flexor plantar response was not obtained until the seventh day. No. 3 is more typical than the others, for there was first a flexor plantar response, which became extensor on the fourth day and was still extensor on the sixth.

Apparently the reflexes do not alter in type at the same time in both legs in all children, for in one case of a male infant five days old the left foot gave a flexor response while the right gave an extensor.

Three pairs of twins were examined (*Table I*), and in each case the plantar responses were similar in both members of each pair, although in pair No. 1 there was doubt whether the response was flexor or extensor in the elder child. It is probable, however, that the response was the same in this child as in the younger member of the pair.

The relation of sex to the plantar response was also investigated. Of 38 males up to and including 6 days old, 26.3 per cent gave flexor plantar responses, while of 20 from 7 to 14 days old, only 20 per cent

gave a flexor plantar response. On the other hand, of 19 females up to and including 6 days old, 52.7 per cent gave flexor plantar responses, while in 9 from 7 to 14 days old inclusive, no flexor plantar responses were obtained. These figures show that in the first week of life the plantar flexor response is more common among females than among males, while the converse holds during the second week. They also show that the decrease in the number of flexor plantar responses obtained during the second week as compared with the first, as shown in *Chart 1*, is largely due to the alteration of the response in females, not so much in males.

The above investigations demonstrate: (1) That there is a period consisting of the first week of life, and to a certain extent the second also, in which a flexor plantar response is often present. (2) This early flexor plantar response, or 'infantile flexor response' (I.F.R.) changes later into the normal extensor plantar response—Collier's 'infantile response'. (3) In some cases, the child commences life with an extensor plantar response, apparently omitting the I.F.R. (4) Twins apparently possess the same type of plantar response. (5) The plantar response need not necessarily change in character in both feet simultaneously. (6) Female infants obtain the extensor plantar response at an earlier period than the males.

#### IV.—CONCLUSIONS.

Upon consideration of the investigations described above, in association with the theories given in Part I of this article, various deductions can be made.

When the phylogenetic theory of the plantar response is viewed in connection with these investigations, it is seen to be supported by a number of facts. If the theory be correct, and the extensor plantar response of infants and of corticospinal disease is really a return to the prehensile toe of our arboreal ancestors, then one would expect to find the normal plantar response extensor in character in arboreal creatures. This was the case with the great majority of animals examined, all the primates giving extensor plantar responses, although in the kinkajou and the chameleon, both of which are arboreal creatures, the response was flexor.

Again, if the extensor reflex be really an atavistic phenomenon representing a prehensile toe, then it should be found in human infants, for the latter often use their toes for grasping purposes.<sup>20</sup> This is what is found in the large majority of cases.

On the other hand, peoples, such as the Japanese,<sup>2</sup> who use their great toes for prehensile purposes, might be expected to have extensor plantar responses as a normal adult condition. Also the kinkajou

should have this type of response, for it spends most of its life in trees, and yet the response was markedly flexor. This could perhaps be explained by saying that its foot is not adapted so well to arboreal existence as is that of the primate. The same reasoning, of course, applies to the foot of the Japanese, however much the great toe is used for prehensile purposes in that race.

If the presence of a flexor plantar response is only dependent upon the integrity of the pyramidal tracts, then it might be expected that animals with an extensor plantar response would have an incomplete pyramidal system, either non-myelinated or structurally interrupted. Neither of these conditions is found, however, in the primates. If the theory be correct, therefore, it would have to be assumed that the function of the pyramidal tracts in man is different from that of the tracts in primates, and all experimental work is based upon the assumption that the functions are similar throughout the mammals.

If the theory that the character of the plantar response is dependent upon the myelination of the pyramidal tracts<sup>16</sup> be considered with regard to human infants, certain data might be taken to support it. Thus myelination of the corticospinal paths in man occurs at the first month after birth,<sup>15</sup> although they first make their appearance in the fifth foetal month.<sup>1</sup> Myelination of the peripheral nerves, however, is not complete until the eighth month after birth,<sup>1</sup> so that it is not until towards the end of the first year of extra-uterine life that structural connection between the sole of the foot and the spinal cord is complete, and this is the period when the extensor plantar response of the infant changes to that of the adult. Accordingly it might very well be said that the change from the extensor to the flexor type is correlated with the myelination of the pyramidal tracts and peripheral nerves. From a consideration of the reflexes found in the lower animals, however, the myelination of these parts of the nervous system cannot be the only condition necessary for the appearance of the adult flexor response, for myelination is present in the monkeys and yet their plantar response is extensor in type.

It has also been stated that the alteration in response from extensor to flexor occurs when the child begins to walk.<sup>9</sup> As this takes place at about twelve months of age,<sup>10</sup> and as the figures of Monrad-Krohn already quoted show that the majority of responses change at this period of the child's life, it is probably correct to say that there is an association between the two. Further, in rickets, when the child begins to walk at a late age, the extensor plantar response is retained until the infant commences walking.<sup>14</sup> It should, however, be remembered that the weaning of the child also takes place at the end of the first year, in particular amongst the poorer classes from

whom most statistics are obtained, since they form the bulk of hospital patients.

As for the extensor plantar response being really a part of a reflex movement of the entire limb, there is nothing in these investigations pointing to a contrary conclusion; for, in this article, the terms 'extensor' and 'flexor' are only so used with reference to the movements of the great toe, those of the various muscles not being studied, and so the responses of these structures may be of various types in the subjects examined. However, the reflex must be of value to the creature concerned, and therefore the most significant and important part of the response is the movement of the great toe, for this is the only external difference between the two types of response, however the actual reflex is brought about.

Upon consideration of the investigations described in this article, it will be seen that as the animal scale is ascended the type of plantar response varies, for the lower creatures give no response or a flexor one, the higher creatures an extensor reflex, while adult man gives a flexor plantar response. Thus there is a succession of flexor, extensor, flexor (or F.E.F.) responses as the animal scale is climbed. Now, on turning to man, it will be at once apparent that there is a similar succession of type of plantar response in the development of the average individual. In the very young infant the response is often flexor, then as the child grows older it is extensor in character, and finally this changes to flexor; thus the same succession (F.E.F.) of plantar responses occurs in man as in the animal kingdom. The stage when no plantar response is present, as in the foetus of 7½ months that was examined, may correspond with the stage of the amphibia and most reptilia in the animal kingdom, where no reflexes were obtained.

This similarity between the succession of the plantar responses in the animal kingdom and in man suggests that the various plantar reflexes obtained in a healthy human being are only a manifestation of the theory so well known that the phylogeny of the race is seen in the ontogeny of the individual.

The succession, F.E.F., of the plantar responses, with an absent response to begin with, corresponds to, and perhaps explains, the phenomena of total transection of the spinal cord in man. Riddoch<sup>12</sup> found that after complete transection there is a period, known as 'spinal shock', in which no plantar response is obtainable; it lasts for one to three weeks. Then, in certain cases, a flexor plantar response is developed, lasting up to as many as forty-two days. This plantar response subsequently changes in character and becomes the well-known pathological extensor response. If these observations of Riddoch are considered in connection with the F.E.F. succession



of plantar responses, it will be realized that the phenomena observed after total transection of the cord are actually a repetition of the ontogenetic, and phylogenetic, history of the plantar response. On section of the pyramidal tracts, the plantar response apparently returns immediately to its most primitive condition, i.e., to what obtains in the  $7\frac{1}{2}$ -months foetus and the amphibia and reptilia, with no response at all. As the cord becomes used to the loss of connection with the higher centres of the brain, a flexor plantar response is developed, which in turn develops into the extensor plantar response. This is apparently unable to become the adult flexor plantar response without some connection with a normally functioning brain, a point to be referred to again later.

It might be argued that the early flexor plantar response obtained after transection of the cord is really the adult flexor plantar response, and that the cord automatically 'carries on' after the stage of 'spinal shock' is recovered from, as it did before the lesion occurred, and that it is only after the properties of 'carrying on' have been exhausted that the extensor plantar response appears. This, however, cannot be the case, for the temporary flexor response obtained after the 'spinal shock' is of a different nature from the normal adult response. In 1899, Collier<sup>6</sup> showed that the adult flexor plantar response is really a part of a complex movement associated with: (1) Contraction of the tensor fasciæ femoris, sartorius, adductors and flexion of the hip; (2) Flexion of the four outer toes; (3) Dorsiflexion of the ankle; (4) Flexion and adduction of all the toes; inversion of the foot by tibialis posticus; flexion of the knee; (5) Contraction of calf-muscles; (6) Contraction of quadriceps.

Now the temporary flexor plantar response obtained after transection of the cord is unaccompanied by palpable tightening of the tendons of the inner hamstrings, or of any other muscle of the lower limb. Later, contraction of the hamstrings occurs, even while the flexor plantar response is still present.<sup>12</sup> But as this contraction is an integral part of the extensor plantar response, since Walshe<sup>18</sup> has shown that this reflex never occurs without contraction of limb flexors, it is probable that the hamstring contraction occurring towards the end of the stage of temporary flexor response is really the beginning of the acquisition of the extensor plantar response.

Gordon Holmes has also shown that the temporary flexor response obtained after transection of the cord in certain cases is different from the normal reflex.<sup>8</sup> As it is only found in a few cases, it is probably related to the fact that apparently some babies do not pass through the stage of infantile flexor response, at any rate, after birth. No doubt such people are of a more advanced type as regards the plantar response than those whose plantar responses are flexor in

character immediately after birth, for they have passed, and left behind them, the primitive flexor plantar response which occurs far back in the pedigree of the human race.

Throughout this article the expression 'pyramidal tracts' has been used without defining clearly whether the crossed or direct tracts are those to which reference is made. By 'pyramidal tracts' is meant the crossed pyramidal tracts, for apparently the direct pyramidal tracts can have no connection with the plantar response. The direct pyramidal tracts, according to Schäfer, are only found in man and the anthropoid apes;<sup>13</sup> therefore, if they are correlated with the plantar response, there should be either a similarity between the normal plantar reflex of man and the anthropoids, or a dissimilarity between the responses of the latter and the monkeys. As can be seen from *Table I*, neither condition exists.

Reference has been made to the connection of the brain with the plantar response: this part of the subject will now be discussed.

In 1914, Walshe<sup>18</sup> published some observations upon cases of complete flaccid paraplegia following cord lesions. These observations suggested that the extensor plantar response is a spinal reflex movement appearing when cerebral control is removed by impaired activity of the pyramidal tracts. Hence the character of the plantar response is dependent upon the proper functioning of the brain and upon its connection with the lower part of the spinal cord.

Other facts point in the same direction. One of these emerges from the investigations carried out by Collier,<sup>6</sup> who found that in some children under twelve years of age the normal flexor plantar response became extensor during sleep. During this state cerebral control is presumably withdrawn from the spinal cord, while the pyramidal tracts remain healthy. Possibly the reason why the above plantar responses were only found in some children is connected with the state to which the nervous system had advanced. In those whose nervous system had reached a high degree of development the extensor plantar response would not return during sleep, for the mechanism by which the response could be brought about would be lost, the cord having progressed beyond the stage at which, at a moment's notice, it could take over the functions of the brain. An alternative reason for the presence of the extensor plantar response during sleep might be that, in the more highly developed nervous system, the higher centres in the brain might act reflexly, having progressed to such an automatic state that a flexor plantar response was given, even though the conscious brain was asleep.

The phenomena occurring after total transection of the cord in man also suggest that the character of the plantar response is dependent upon the active functioning of the brain: when the latter

is withdrawn, the cord is unable at once to return in all cases to the immediate primitive condition, for the cases examined by Riddoch were adults. The cord, however, even in adults, can return to a primitive condition, giving an extensor plantar response: but it must, as it were, be re-educated first, passing through its phylogenetic history in the process.

Lastly, if the investigations described in Parts II and III of this paper are viewed in the light of the theory that the character of the response is dependent primarily upon the brain, and only upon the pyramidal tracts in that they are the paths by which the brain controls the plantar reflexes, they will be seen to suggest the correctness of the theory. For, as the brain becomes more developed, the plantar response changes from the early flexor type to the extensor, and then to the flexor of the highly-developed human adult. In viewing the same F.E.F. succession of responses in the growing child, the same correlation with the development of the brain will be noticed: the mental outlook of the infant must develop enormously in the first few days after birth, and again towards the end of the first year of life when the child begins to talk. It is perhaps significant that the approximate time when speech begins should coincide with the development of the permanent flexor plantar response, for in infants before they have learnt to talk, and in anthropoid apes and monkeys, who of course are unable to talk, the extensor plantar response is the normal condition. This suggests that the type of plantar response is dependent upon the development of the brain.

Apparently the most highly developed spinal cord, that of man, is unable to produce the most advanced type of plantar response, the adult flexor plantar response, unless it is connected with that other possession of mankind alone, the highly-developed brain.

### SUMMARY.

The following conclusions may be drawn from the investigations described in this article:—

1. There is a flexor plantar response of a primitive character that occurs in the lower animals, in the majority of very young human infants (the infantile flexor response), and in certain cases of total transection of the adult human cord.
2. The primitive flexor plantar response changes to an extensor response as development proceeds, either as the animal scale is ascended, or as the child grows older, or as the spinal cord re-adapts itself to its altered conditions after transection.
3. The extensor plantar response changes to a flexor plantar response in animals higher than the anthropoid apes, i.e., in man.

Thus there is a succession of flexor, extensor, flexor, or F.E.F., responses both in the phylogeny of the race and in the ontogeny of the individual. In the case of total transection of the cord in man, the final adult flexor plantar response is not obtained.

4. The theory that the alteration of the plantar response from extensor to flexor is due to the myelination of the pyramidal tracts is apparently incorrect; more probably it is due to the myelination of the peripheral nerves, which occurs at the eighth month of life.

5. The hypothesis that the extensor plantar response of infants and of 'spinal' man is an atavistic phenomenon dependent upon the prehensile toe of our arboreal ancestors is not shown by these investigations to be incorrect.

6. The normal adult flexor plantar response is due to the control of the brain over the lower centres of the cord, and this control is exercised only by the brain in its most highly developed form, i.e., the brain of man.

In conclusion, I must thank most sincerely all those who have so kindly helped with this investigation. In particular I wish to thank Dr. Kinnier Wilson, of King's College Hospital, for his invaluable aid; also Dr. C. F. T. East, Mr. M. Ahmad, and the Misses N. B. Daniell, L. M. Elsom, M. A. Quine, R. Leak, M. V. Saul, and A. B. Smith. I must also thank all those who so kindly allowed me to examine animals under their care, particularly Mr. R. I. Pocock, F.R.S., Superintendent of the Gardens of the Zoological Society, Regent's Park; Mr. A. Edmunds, F.R.C.S., of King's College Hospital; and Mr. Vincent, Director of Messrs. Gamage Ltd.

Since the above was written, Dr. Burr's article in the *American Journal of Diseases of Children*, Vol. xxi, June, 1921, has been brought to my notice. Dr. Burr states that the plantar response may be absent up to the third month or longer in human infants. He quotes his own and Engstler's figures in support of this.<sup>21</sup> In no infant in my series was the plantar response absent with the exception of the one case mentioned. This apparent difference in the results of the investigations may be due to the circumstance that both Burr and Engstler regard as a plantar response the movement of the toes, not of the great toe alone. Consequently, if the great toe were to move while the other toes were motionless, Burr and Engstler would presumably describe the response as absent, whereas I should describe it as present.

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## IRIDOCYCLITIS — PAROTITIS — POLYNEURITIS : A NEW CLINICAL SYNDROME.

BY ANTHONY FEILING AND GEOFFREY VINER, LONDON.

THE case to be described is an example of a clinical picture which appears to be very little known, but is nevertheless one which has been recognized and described in medical literature. Briefly, the syndrome consists of iridocyclitis and parotitis, with or without involvement of either cranial or peripheral nerves, and occasionally accompanied by cutaneous lesions. Whether this syndrome is produced by any specific infection or may occur as the result of several different infective agents is still an open question. In this particular case no definite infective agent could be isolated.

Ida C., a waitress, was admitted to the Hospital for Epilepsy and Paralysis, Maida Vale, on March 23, 1921, complaining of feeling tired and drowsy all day, of a dull aching pain in the back, occasional neuralgic pains in the jaws and neck, and mistiness of vision in both eyes.

**History.**—She had felt seedy and run down since the beginning of February, 1921. During the first two days of March she felt particularly ill and drowsy, and her back ached. On the evening of March 3 she noticed that her mouth was drawn over to the left side. Two days later mistiness of vision in the right eye was noted, which became progressively worse. About March 12 the left eye became affected as well. On March 10 the mouth was said to have returned to the middle line, but it was felt that the left side of the face was now weak as well as the right. Her sister had noticed a slight swelling in front of the right ear about two days after the paralysis of the right side of the face had occurred; a few days later a similar swelling appeared on the left side of the face. No diplopia nor any weakness of the limbs had been noticed.

**On Examination.**—The patient appeared a well-nourished and healthy young woman, though somewhat pale.

**Eyes.**—Both showed much ciliary injection. *Corneæ*: haziness of the deep layers with numerous 'K.P.' Pupils widely dilated, reacting very faintly to strong illumination, inactive to accommodation. No synechiæ. Vitreous full of fine floating opacities. No optic

neuritis. Fundus details not visible. *Tension*: full to +1 each eye. *Acuity of Vision*: counted figures at 2 metres right eye, at 4 metres left eye.

Both parotid glands were swollen, but somewhat hard, and without any of the usual evidences of active inflammation (pain, tenderness, redness, etc.). A bilateral facial paralysis of the peripheral type was present, more marked on the right side; no affection of taste could be detected. The functions of the other cranial nerves appeared normal. Examination of the rest of the nervous system was negative except that the tendon reflexes in the arms were only obtained with great difficulty, the knee-jerks were very sluggish, and both ankle-jerks were absent. On the sensory side she complained of some numbness in the fingers of both hands, but no actual loss of sensation could be demonstrated. Physical examination of the heart, lungs, and abdomen was quite negative. The urine contained no abnormal constituent.

A definite rash was found on the skin. This was seen on the anterior aspects of both legs and the lower parts of the thighs. The lesions consisted of small erythematous patches, reddish to purple in colour, varying in size from a sixpence to a shilling, not unlike small lesions of erythema nodosum but without the same amount of induration. There was no fever.

An examination of the blood showed the leucocytes to be 5500, with the differential count as follows: polymorphonuclears 65.5 per cent, lymphocytes 28 per cent, large mononuclears 3.2 per cent, transitionals 8 per cent, eosinophiles 3.2 per cent. The cerebrospinal fluid appeared normal to the naked eye; it contained only 15 cells per c.mm., of which all were lymphocytes; the Nonne-Apelt test for globulin was negative, and the percentage of albumin was only 0.015. The Wassermann test was negative in both the blood and the cerebrospinal fluid.

A careful examination was made for any source of infection in the mouth, teeth, throat, ears, nose, and urinary tract, but without any definite result. All the teeth had been removed some years before. The bowels were open regularly, and the stools appeared normal.

On April 4 the condition of the eyes had become worse. The ciliary injection was more marked; 'K.P.' were more numerous. The sclerotic in the ciliary region for a distance of 3 to 4 mm. from the corneal margin was acutely inflamed and raised, forming a ring surrounding the cornea; this was more obvious in the right than the left eye. Tension +1 each eye.

The swellings of the parotids were still present, but were smaller and certainly harder. No other glandular enlargement could be found. The paralysis of the right side of the face was still complete, but on

the left side a certain amount of recovery had taken place: the left eye could be closed nearly completely, and on voluntary movement the mouth was definitely drawn to the left side: wrinkling of the forehead was absent on both sides. The signs of polyneuritis in the limbs were more definite. There were sensations of numbness and tingling in both hands, and some unsteadiness in the performance of the finer muscular movements of the fingers. Both supinator- and both triceps-jerks were lost; the knee-jerks and the ankle-jerks on both sides were lost also. There was no definite atrophy of muscles, no paralysis in the limbs, and no objective disturbance of sensation.

On April 23, and again on April 29, a paracentesis of the anterior chamber of the eye was performed on each eye, to relieve the intra-ocular tension.

By May 9 the general condition had improved, though the eyes remained about the same. The swelling of the parotid glands had disappeared, the paresis of the left side of the face was clearing up, but the paralysis of the right side of the face was still nearly complete: the tendon-jerks in the arms were still absent, but the knee-jerk on the right side could be obtained. The left knee-jerk and both ankle-jerks were still lost.

By May 30 both knee-jerks had returned, but the supinator-jerks were still absent, as well as the triceps-jerk on the left side. The rash had also disappeared, gradually fading away without undergoing any material change. Steady improvement in the eye was now apparent. A blood-count taken at this date showed: red blood-cells 4,920,000 per c.mm., white cells 9000, hæmoglobin 90 per cent, colour index 0.9; so that the slight leucopenia present at the first had disappeared.

Steady improvement in all the symptoms now followed, and on June 20 the following note was made: "The patient is much stronger, walks well, and takes her food well. Eyes: the pupils are unequal, right being dilated and larger than the left. The right pupil does not react to light at all, while the left does so sluggishly: the intra-ocular tension has diminished. There is still considerable ciliary congestion, especially in the right eye. In the arms the tendon-reflexes are now active. The knee-jerks are both present; but both ankle-jerks are still lost. There is no subjective or objective disturbance of sensation." On July 1 the patient was able to leave the hospital.

The case may be summed up as showing the following features: (1) Double iridocyclitis of severe degree with cycloplegia: (2) Double parotitis; (3) Double facial paralysis; (4) Some signs of a generalized polyneuritis; (5) The presence of a rash on the skin.

It is interesting and important to note that the first symptom to attract any serious notice was the facial paralysis on the right side,

which preceded both the inflammation in the eyes and the swelling of the parotid glands. Indeed, the patient was seen by one of us as an out-patient on March 3 and regarded as an ordinary case of peripheral facial paralysis (Bell's palsy). Mistiness of vision in the right eye and some swelling of the right parotid gland were not noticed till at least two days later.

The first question that naturally arises is, Was the case not one of mumps with complications in the shape of polyneuritis and iridocyclitis? We are emphatically of the opinion that it was not a case of mumps, for the following reasons: (1) The appearance of the facial paralysis on the right side, which was severe from the onset, definitely preceded the swelling of the parotid glands by at least two days. (2) The swellings of the glands themselves were quite unlike that of mumps. Instead of the usual rather diffuse swelling of the gland, which is soft, and fills up the hollow between the ear and the angle of the jaw, producing the characteristic facial appearance, this case presented a swelling confined for the most part to the pre-auricular portion of the gland, harder and less noticeable than the ordinary swelling of mumps. The swellings further persisted for much longer than is usually the case in mumps. Other points which render the diagnosis very unlikely are the presence of a leucopenia at the onset of the disease, the absence of a marked lymphocytosis in the cerebrospinal fluid in a case exhibiting such marked signs of nervous involvement, the presence of a double and very persistent facial paresis, and the signs of a polyneuritis.

Facial paralysis has been reported in mumps, but has not been known to precede the swelling of the parotid glands. Couraud and Petges saw 7 cases of facial paralysis in an epidemic of 60 cases. It appeared at a time varying from three to nine days after the onset of the disease, was always unilateral, and lasted from six to ten days only, disappearing completely without treatment: a totally different picture from that presented by the case under discussion. Though a persistence of the swelling of the parotid glands on one or both sides has been reported as a sequel to mumps, it is in the highest degree unusual and may justly be regarded as clinical evidence against the disease. Feiling,<sup>1</sup> in a previous paper, has reviewed the various complications of mumps, and a reference to his paper will confirm the additional reasons given above for regarding the present case as being some infection other than mumps. Mackay<sup>2</sup> in 1917 published a paper entitled "A case of uveoparotitis with iridocycloplegia", in which he records in detail a case similar in many respects to that here reported, and further summarizes the literature up to that date. Mackay's case was that of a woman, age 30, who first presented herself on March 10 with iridocyclitis and cycloplegia: about a week

later swelling of the pre-auricular parts of both parotid glands appeared; on April 24 it was noticed that the parotid glands were still slightly indurated. His case appears to have shown no nervous complications. He quotes a valuable paper of Heerfordt's entitled, "On a subchronic uveoparotid fever localized in the parotid gland and the uvea of the eye, and especially complicated with paresis of cerebrospinal nerves". Heerfordt<sup>3</sup> records three cases of his own which, in addition to iridocyclitis and parotitis, showed signs of involvement of the cerebrospinal nerves in the shape of optic neuritis in one case, transient facial paralysis and some dysphagia in a second, and in the third a right-sided facial paralysis with disturbance of sensation in the skin of the abdomen and hands. His cases did not present cycloplegia. Heerfordt quotes two other cases which he considered to belong to the same group.

Mackay was able to find in the literature since Heerfordt's paper only six cases of dilated pupils and paralysis of accommodation with parotitis; of these it is probable that three followed mumps. Brewerton,<sup>4</sup> however, in 1910, reported a case which is very similar in many respects to that of the writers, and which is particularly interesting in having also shown a skin rash. It was that of a boy, age 17, whose illness began on Nov. 18 with a rash, supposed to be nettle-rash, on the face and arms, lasting five days; when the rash was subsiding a small lump was noticed in the right side of the face, and on the next day on the left side also. When examined six days later both parotid glands were swollen and very hard; both eyes showed iridocyclitis with keratitis punctata and posterior synechiae; vision was reduced to counting fingers at two feet. In January he developed a rash which was considered to be an atypical form of erythema nodosum. The affection of the eyes in the writers' case was one of acute cyclitis and anterior scleritis complicated by secondary glaucoma of marked degree, which necessitated frequent paracentesis of the anterior chamber of the eye to relieve the tension. In addition there was almost complete cycloplegia. The condition was probably caused by a generalized toxæmia, and consequently the eye affection was primarily vascular and localized in the ciliary body. In spite of the severity of the inflammation, recovery of sight has been nearly complete and the cycloplegia has entirely disappeared.

In comparing the case with those quoted from the literature it is impossible not to be struck with the similarity presented. The two symptoms common to all are the inflammatory lesions in the eyes (with or without a paralysis of the pupils) and the parotitis. These would seem to be an essential feature of the disease if this syndrome can be raised to the position of a clinical entity. Other symptoms are involvement of either the cerebral or spinal nerves or both in



what must be regarded as a toxic neuritis; in one case at least (the writers') symptoms of this neuritis in the shape of a peripheral facial paralysis preceded all other objective manifestations of the disease. In two cases rashes on the skin have been observed.

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## Editorial.

### THE PSYCHOLOGICAL FACTOR OF ALCOHOL.

THE fact alone that in all countries mankind has spontaneously indulged in fermented liquors should lead us to presume that such a trend must have some deep-seated origin. It is, therefore, to be deplored that hitherto the relationship of alcohol to society and the individual has largely been treated superficially, which accounts for the meagre enlightenment thrown upon the problems involving the community, and the highly inadequate understanding of those prevalent mental abnormalities which have an evident connection with alcoholic indulgence and with which psychiatrists are more especially familiar. A cursory investigation only will be sufficient to reveal that, in the main, mankind does not imbibe alcohol for the purpose of quenching thirst or because it specially gratifies his palate, but for some less evident reason. It is true that such an assertion would not seem to hold good if we relied upon the individual's statement as to the meaning of his impulse: but on such a theme man rationalizes freely, and it is not difficult to see that, at any rate to a great extent, he is unconsciously motivated. Tradition and habit have their values, of course, in moulding action: but we are here mainly concerned with the broad contention that in modern civilization alcohol seems to be a necessary factor to the majority of those constituting society, in that it affords, by means of its psychological effects, a refuge from the mental conflicts which, in our present era, must result from inhibition of instinctive forces and the warring of internal antagonistic tendencies. Modern psychology and recent study of abnormal mental states have thrown much light upon the mechanisms of the mind which operate in the strivings towards adaptation to environment, in the correctness of which lie happiness and mental health.

It is found, too, to be an unfortunate fact that not only do mental conflicts of various types and degrees exist in the majority of us, but that their healthy solution is perhaps only too infrequent, this being due partly to psychopathic soil and partly to a defective insight into the real factors involved. In most instances the fact that any mental conflict exists within us may very likely be only dimly recognized, or not at all. Mankind has found that the taking of alcohol

acts as a narcotic at the psychological level, and thus, by benumbing the discordant elements, mental equanimity is gained. Thus unconsciously does a large section of the community upkeep a certain mental equilibrium, and we go so far as to say that thereby much so-called 'nervous' illness is held in check or aborted, and that without this aid mental illness might be even more in evidence. Alcoholic drinking, of course, may also be consciously resorted to in times of worry and stress, and with moderate imbibition similar results occur. We should be scientifically correct in saying that in many instances such a refuge in the face of mental strain is a poor type of adaptation: but too frequently it forms the only solution, notwithstanding the dangers that beset such a path. Trotter, in his work on *Herd Instinct*, confirms our thesis, and points out the psychological necessity of alcohol as a means for securing some way out, for however short a time, of the prison-house of reality.

There is no doubt also that alcohol tends to promote the social instincts, and in this way helps many to a more adequate adaptation to the community in which they exist. The sensation of elation which is commonly experienced after a certain quantity of alcohol is absorbed, though partly due to somatic causes, is also due to the psychological effect, since thereby various social taboos and ethical inhibitions have had their repressing forces lessened, and the individual concurrently feels a greater freedom of his ego and enhancement of personal power. It is seen, then, that alcohol acts upon the psyche in such a way that the more recently acquired adaptational activities are placed in abeyance, with consequent regression to more individualistic thought and action which will differ according to the personality. '*In vino veritas*' is thus scientifically true. Sublimation tends to be abrogated, and suppressed and repressed trends are apt to be freed. Psycho-analysts draw attention to the facts that man drinks usually in the company of his fellow-man, that affectionate behaviour is not uncommonly seen among those who are well under alcoholic influence, and from these observations and their analytic findings they state that a latent homosexuality is thus released. Other impulses may be brought into evidence according to the particular mental soil involved. We may deduce from this that the 'no treating' regulation during the war had a definite psychological basis in its tendency to lessen alcoholic consumption.

When impulses averse to the personal ego-ideal are thus liberated, it is not difficult to see how mental conflict may ensue, which may in its turn induce further and continued libations, so that a vicious circle is set up, with chronic alcoholism as a result. The drunkard's humour is proverbial. It is a reaction to disguise the reality of his inner life. The conflict may, however, especially in a psychopathic individual,

be such that the line of least resistance points to a solution by means of a psychoneurosis or psychosis. Alcohol as a refuge has failed, and peace and safety are sought in the flight into disease.

Psychiatrists classify the psychoses arising in connection with alcohol under the heading of 'toxic psychoses', but from what has been said above, we must see that, with the exception of such forms as Korsakow's syndrome, alcoholic dementia, and delirium, there is no evidence pointing to a toxic origin, whereas there is every indication of emotional traumata which the alcohol has in some way only contributed to by release of buried complexes. The prominent symptoms of delusions of jealousy, grandeur, suspicion, and eroticism can be unravelled in the light of mental conflict, and the hallucinations commonly show the impulses which have been dissociated and projected. Added confirmation is found in the absence of physical signs pointing to any organic implication, and also in the fact that similar clinical pictures may be observed where alcohol can with certainty be excluded in the history. Cessation of further alcoholic indulgence may bring about the disappearance of the abnormal symptoms through re-adaptation and return of the sublimation which had been destroyed.

A study of the psychological factor of alcohol becomes a subject of great importance, therefore, in the light of modern research, not only to the psychologist and psychiatrist but also to the sociologist and statesman. It seems that in civilization as it exists no good can accrue from prohibition, and that mankind, robbed of this refuge, would perforce fly to others of a less desirable nature.

## Abstracts.

### Neurology.

#### NEUROPATHOLOGY.

- [151] Natural history of cerebral tumours (Histoire naturelle des tumeurs cérébrales).—C. DE MONAKOW. *L'Encéphale*, 1921, xvi, 177.

THE chief part of this interesting paper is an attempt to solve the difficult problem of the origin of gliomata. While many forms of tumour arise in organs which have been subjected either to gross trauma or to long-continued inflammation or irritation, this does not hold true for gliomata, a very small proportion of which follow injuries to the head. What, then, is their etiology, and what measures are we to take to prevent their occurrence? These are the questions which de Monakow attempts to answer.

His theory of their origin is a modification of the 'cell-rest' theory of Cohnheim. In the early development of the glial scaffolding of the nervous system, "in the development, grouping, and differentiation of the cells, the rhythm and harmony of the architectural 'melody' must be exactly followed". This harmony may be marred in many ways. Colonies of glial cells after leaving the ependymal mother cells may develop too rapidly or too slowly, or may become displaced, and may thus become danger centres in later life. Such colonies of cells are frequently seen in the spinal cord, and may be the starting-point of gliomata. It is also known that when at an early stage of development the oral end of the neural tube is injured, the sacral end may show a tendency to overgrowth, resulting in reduplication of the lumbar region of the cord, in gliomatous formations due to over-activity of all the developing cells, or in cysts either in the substance of a tumour or near the central canal.

De Monakow considers that the colonies or groups of cells which leave the ependymal mother cells at an early stage are at feud with those which leave them at a later stage of development, and between these various groups there ensues a struggle for existence. Therefore, when the older cells tend to succumb to harmful influences, a group of younger cells which has been imprisoned, functionless, in the neighbourhood, may spring into activity, and by excessive proliferative activity give rise to a tumour. The older cells put up what fight they can against this intrusion, and sometimes or in some places are successful in destroying the invader. Thus arise gliomatous cysts, and encapsulated gliomata. De Monakow thinks that decompressive operation at this stage may aid the normal glial cells in their fight against the tumour-cells, as the excessive intracranial pressure and consequent diminution of blood-supply act in favour of the new-comers.



In his view the neuroglia adds to its functions of scaffolding and scavenging the nervous system the power of protecting the nerve-cells. Thus in neuronophagy newly-formed glial cells cluster round the nerve-cells to protect them from toxins or other harmful influences. A similar protective action is exerted in all forms of tumour formation. This theory seems to be getting a long way away from chemiotaxis, to which most authors attribute the migration of neuroglial and other cells.

Another view which may not receive general acceptance is that in brain tumours, as well as in other lesions of the brain tissue, an additional supply of cerebrospinal fluid is called for by a sympathetic mechanism involving the non-myelinated nerve-fibres in the choroid plexus. This seems to leave out of account such factors as the rise in the general intracranial venous pressure, and the obstruction to the circulation of the cerebrospinal fluid which results from the increasing bulk of the brain. These factors rest on solid scientific foundations, and are quite sufficient to explain the hydrocephalus which invariably accompanies brain tumours.

On the whole this article can scarcely be considered as a serious contribution to scientific knowledge. Many of the newer theories propounded seem to be based on very flimsy foundations of observation or correlated facts, and the expressions used in stating them are often so metaphorical that it is difficult to form a clear idea of the writer's meaning. In the end we do not seem to get beyond the three theories of Cohnheim, Ribbert, and Adami, which, in combination, suffice to explain most forms of tumour in the nervous system as elsewhere in the body.

J. G. GREENFIELD.

[152] **Experimental studies on hydrocephalus.**—J. C. NANAGAS. *Johns Hop. Hosp. Bull.*, 1921. xxxii, 381.

THIS record of a series of experiments on kittens is of considerable interest to the neurologist. Internal hydrocephalus was produced, after withdrawal of the cerebrospinal fluid, by intraventricular injection of a suspension of lamp black in physiological saline. Intravenous injection of a strongly hypertonic solution of sodium chloride in hydrocephalic animals produced a brief initial rise followed immediately by a marked depression, a phenomenon to be explained probably by rapid absorption of the fluid from the dilated cerebral ventricles. By means of the replacement of the ventricular fluid by a solution of potassium ferrocyanide and iron ammonium citrate, and by injection via the aorta, after the animals were killed, of a fixing solution of formalin with 1 per cent hydrochloric acid, a precipitate of Prussian-blue granules was formed where the ventricular fluid had escaped during the two hours that elapsed between the injection and the sacrifice of the animals, and macroscopical and microscopical examination showed these granules to be massed immediately under the ventricular ependyma and to have penetrated the brain substance in zones of decreasing intensity. Anatomical and physiological proof is furnished by these experiments of the absorption of intraventricular cerebrospinal fluid by the ependyma, a fact which has a direct bearing on the problem, *inter alia*, of disseminated sclerosis.

S. A. K. W.

- [153] **Contributions to the doctrine of cerebellar heredo-degeneration** (Beiträge zur Lehre der zerebellaren Heredodegeneration).—KARL SCHAFER. *Jour. f. Psychol. u. Neurol.*, 1921, xxvii, 12.

SCHAFER's long paper is based on the examination of two cases, one of cerebellar ataxia with idiocy, and one of Marie's cerebellar heredo-ataxia, both of which are described in the minutest histological detail.

In the first (which Schaffer notes presented some resemblances to the picture of aplasia axialis extracorticalis congenita of Merzbacher, though he is not convinced of the specificity of the latter) the chief lesions were (1) 'Anlage'-defects, viz., abnormalities of convolitional pattern, hypoplasia of corpus callosum, cerebellum, and pons, doubly nucleated cortical nerve-cells, cytotoxic defects in the association areas of Flechsig; (2) Progressive degeneration of a systemic kind involving cerebro-cerebello-pontine tracts (fronto-pontine, temporo-pontine, cerebellar peduncles). In the affected areas the degeneration involved ectodermal elements only, and not mesodermal, and Schaffer suggests this electivity as regards both certain cortical layers and fibre-systems is a sign of a primary, i.e., of a heredo-degenerative process. The conservation of the cortical motor and sensory projection systems and the deterioration of the association systems was one of the peculiar features of the case, as was the degeneration of the commissural systems, and the suggestion is that motor and sensory systems are ontogenetically older and more resistive. The degeneration in the cerebellum was essentially neocerebellar, but both paleocerebellar and neocerebellar portions of the cortex were hypoplastic. In a word, the disease implicated definite organic anatomo-physiological complexes, apparently *ab ovo*.

As for the second case, diagnosed as cerebellar ataxia, the patient was a woman who had shown symptoms for some ten years and who died at the age of 42. The main lesions were: (1) In the cerebrum: diffuse and chronic cell changes all over and in all layers, but chiefly in the gyri angularis and fusiformis, in the cornu Ammonis, and in the deeper strata (layers 3 to 6); (2) In the cerebellum: a systematized degeneration of the neocerebellum only, implicating Purkinje cells, and the cerebellar nuclei; (3) In the hindbrain: a remarkable involvement of sensory protoneurones only of the seventh, eighth, and tenth cranial nerves. No vascular alterations were noted, so that the case appears again to be one of pure ectodermal degeneration in certain selected systems in cerebellum and hindbrain, while the additional cerebral changes perhaps represent a chronic spread of the same process, being equally of a neuronal nature.

S. A. K. W.

- [154] **Quantitative estimation of total protein in the cerebrospinal fluid.**—J. B. AYER and H. E. FOSTER. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 365.

THE authors have devised a method of estimating accurately the protein in the cerebrospinal fluid. This they do by precipitating the protein by sulphosalicylic acid, and reading by means of a colorimeter against a standard prepared at the same time from a blood-serum solution of known

protein content. The percentage error was found to be less than 5. The normal protein content was found to be between 13 and 38 mgrm. per 100 cc. They regard any figure above 40 as pathological. The protein may be derived from exudation from meningeal vessels under pathological conditions. All sorts of pathological conditions showed an increase, and often this was the only sign of any abnormality in the cerebrospinal fluid. After repeated lumbar punctures the protein content diminished, suggesting a possible compensatory hydroporrhea which may have some relationship to so-called lumbar-puncture headaches.

R. G. GORDON.

[155] **On the viscosity of the cerebrospinal fluid.**—T. SODA. *Jour. of Nerv. and Ment. Dis.*, 1921, liv, 227.

THE author has carried out an elaborate investigation as to the causes and significance of changes in the viscosity of the cerebrospinal fluid. This is found to be increased by the amount of protein, by the alkalinity, and by the number of cells, but to little or no extent by variations in other constituents. Its diagnostic value is slight, and can only be regarded as confirmatory to other tests which would seem more certain and more easily carried out. The chief value of the paper would seem to be to dissuade ardent pathologists from expending their time and energy on the investigation of this property of the cerebrospinal fluid, since in the hands of several investigators it has proved to be practically without value.

R. G. GORDON.

#### SENSORIMOTOR NEUROLOGY.

[156] **Labyrinthine type of epidemic encephalitis** (La forme labyrinthique de l'encéphalite épidémique).—J. A. BARRÉ and L. REYS. *Paris méd.*, 1921, Oct. 1, 261.

THE writers draw attention to the occurrence of symptoms of vertigo, loss of equilibration, etc., in an epidemic of encephalitis, and they describe the following features of a special clinical type of the affection:—

1. A pure type, which was found 12 times in 110 cases. In this type the onset is sudden, with vertigo; the patient often falls down, or staggers like a drunken man. There are general symptoms of malaise and feebleness, with vomiting in some cases. There are no eye symptoms, and no somnolence. Rest abates the symptoms, while walking exaggerates them, especially walking in street traffic, when a veritable crisis may occur, with transient diplopia and mental excitement.

The objective signs are usually only elicited when the eyes are moved to their extreme lateral range, and are worse on looking to one particular side. Rombergism is present, and the Babinski-Weil test with outstretched hands is positive (slow displacement of an arm to the right or left will occur after a few moments). The last described sign has proved more sensitive in the writer's experience than rotation tests, thermic or galvanic tests, etc. Another sign will be found in some cases, consisting in a derangement of convergence either in the upward or horizontal direction. A minor sign

is immobility of the head on the trunk when associated movements are performed, and modified Parkinsonian features also occur.

2. The second type or group comprises those mixed types in which some of the above features occur.

Treatment by quinine, etc., is shortly mentioned.

LEWIS

J. LE F. B.

- [157] **Contribution to our knowledge of lesions of the subthalamie region** (Beitrag zur Kenntnis der Läsionen der subthalamischen Region).—BRESOWSKY. *Monats. f. Psychiat. u. Neurol.* 1921, 1, 302.

THE patient was a woman, age 39, with right progressive hemiplegia and double optic neuritis. Owing to her mental state she was somewhat difficult to examine minutely. Not long before death, well-marked exophthalmos of the right eye made its appearance, whereas the left eye was normal in this respect.

At the autopsy an abscess was found in the middle of the left optic thalamus, which had made its way towards the left crus, involving, amongst other things, the left red nucleus.

Among the unusual features of the case are (1) the absence of the ordinary symptoms of thalamic lesions, though herein the case is by no means unique, and (2) the presence of contralateral exophthalmos. In the author's opinion the case provides pathological confirmation of the experiments of Karplus and Kreidl, according to whom there is a central sympathetic representation in the regio subthalamica, excitation of which in animals produces all the signs of stimulation of the cervical sympathetic.

S. A. K. W.

- [158] **The localization of apraxia** (Zur Localisation der Apraxie).—FORSTER. *Monats. f. Psychiat. u. Neurol.* 1921, 1, 1.

IN the brain of a patient who showed the clinical symptoms of apraxia on both sides, particularly on the left, three tumours were found: the first in the left frontal region between the second and third frontal gyri, almost reaching to the precentral gyrus; the second rather further back on a vertical transverse section, lying in the first frontal gyrus; the third, in the corpus callosum.

From their position they interrupted connection between the motor area and the frontal cortex, as also between one motor area and the other via the corpus callosum, whereas the motor regions themselves were intact: there was not, however, interruption between the latter and the temporal and parietal lobes.

Forster considers the apraxia in his case can be explained by the interruptions of the frontal connections, and that the left-sided apraxia is additionally produced by the interruption of callosal fibres; but he is unable to exclude the possibility of defect of temporal or temporo-parietal function as an indirect result of the tumours.

S. A. K. W.



- [159] **The medical significance of disorders of speech.**—S. BLANTON. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 373.

LEAVING aside the various forms of aphasia, four forms of speech disorders are distinguished: (1) Delayed speech (as infants), due either to mental defect or to a functional failure of adaptation to the environment commencing in infancy. (2) Letter substitution (lispings and lallings), due to mental deficiency, persistence of infantile habits, or regression to the infantile personality. The author does not think malformation of the palatal or dental arches has much, if anything, to do with this. (3) Oral inactivity (slurring speech). The author describes this as idioglossia, but does not refer to what is usually understood by this term in the English literature. It occurs in organic brain defects such as G.P.I., cerebral hemorrhage, etc., also in severe fatigue and toxic conditions, and in states of extreme fright or timidity. In addition, a type said to be due to endocrine-vitamin defect is described. (4) Stuttering. Four varieties of this are described: (a) Organic (G.P.I., etc.); (b) Endocrine-vitamin defect; (c) Hypomanic type; (d) Psychoneurotic.

The latter type is described in full, and that occurring in soldiers and children compared. The author concludes that there is always a mental emotional maladjustment behind this, and believes this must be considered in treatment; hence treatment by elocutionists, voice-producers, etc., is not likely to succeed, since they deal with the stutter *per se*. He calls attention to the high percentage of stutterers amongst left-handed children who have been more or less forced to become right-handed and so have undergone a disturbance of their general motor adjustment.

R. G. GORDON.

- [160] **The abdominal crises of migraine.**—J. A. BUCHANAN. *Jour. of Nerv. and Ment. Dis.*, 1921, liv, 106.

SEVEN cases are described with severe abdominal pain associated with typical migraine. Five of these had been operated upon without benefit. The author claims that his studies in the family history of migraine patients prove that it is handed down as a simple Mendelian characteristic. For this reason he considers it a physiological manifestation in those in whom it occurs, and concludes that it is owing to this fact that it cannot be benefited by medical or surgical means.

R. G. GORDON.

- [161] **A study of patients subject to convulsive seizures.**—L. H. ZIEGLER. *Jour. of Nerv. and Ment. Dis.*, 1921, liv, 107.

THE study is based on twenty cases of epileptics selected at random from the inmates of St. Elizabeth's Hospital, Washington. They were examined from various standpoints. First, it was found that these cases had a larger proportion of anatomical abnormalities such as cranial asymmetry, high palates, etc., than would be found in non-epileptics. These abnormalities were such as would suggest dyspituitarism, especially of the infantile type. The author leans to the theory that hypopituitarism is associated with epilepsy, and quotes Cushing as maintaining that pituitary secretion has an influence in stabilizing cortical cells.



The physiological attributes of the cases are found to be as follows: They are unstable and undergo profound changes within short intervals. As regards food and comfort, they are in many respects infantile, and in their periodic reactions there are evidences that they are characteristically infantile as well as adult. The infantilism may not be constant, but may appear at irregular intervals, and makes a most motley and incongruous character.

Next, the observation that cheese increases epilepsy is considered. Casein, the chief constituent of cheese, contains the three amino acids, histidine, tyrosine, and tryptophane, and the chemical similarities between these and pituitrin, adrenalin, and thyroxin are noticed.

The author considers that the undoubted tendency to psychological regression shown by epileptics is simply the psychological counterpart of the anatomical and physiological infantilism. His conclusion is that epilepsy is the particular way that a person has of behaving in the presence of real or imaginary situations. The individual is a biologically inferior. He may compensate for some of this inferiority by unusual abilities. His inferiority, whether from pituitary disorder or of other origin, nevertheless exists, and concomitant with it are certain physiological conditions which represent the epitome of a tendency to act in a mass reflex. On the assumption that epileptics are biologically inferior we should not throw up our hands as a fatalist would do, but strive by our studies in anatomy, physiology, chemistry, pharmacology, and psychology to meet them half-way, to build what barriers we can around their weakest traits.

R. G. GORDON.

- [162] A sign occurring in cases of tabes complicated by Charcot joints. LEO ELOESSER. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 604.

SOME cases of tabes are met with which exhibit painful Charcot joints. This at first seems paradoxical, since Charcot joints are supposed to be due to traumatic lesions to joints unprotected by the defensive sensation of pain. In these cases, however, if a pin is passed through the skin the patient feels the sensation as it passes the skin, but the point can then be moved over the periosteum without eliciting response. The arthritis therefore does arise in an insensitive joint, but the pain is due to the stretching of the skin by the swelling from the inflammatory exudations. From this it follows that pain fibres from the skin and from the deeper structures pass up through the cord by sufficiently different routes to allow of one being affected by disease while the other escapes.

R. G. GORDON.

- [163] Amyotrophic combined syphilitic sclerosis (Sclérose combinée syphilitique amyotrophique à évolution progressive).—H. CLAUDE and H. SCHAEFFER. *L'Encéphale*, 1921, xvi, 65.

THE case detailed in this paper is that of a woman of 38, with no history of syphilis other than a transient diplopia and dimness of vision in 1912. In October, 1917, she commenced to have weakness of the extensor muscles

of the left foot, with preservation of knee-jerks. This progressed, and was accompanied by slight loss of sensibility on the dorsum of the left foot and lancinating pains in the right leg. In April, 1918, there was weakness and inco-ordination of both legs, particularly the left, diminution of the knee-jerks, and loss of the ankle-jerks. By this time there was definite wasting of the left calf. Both pupils showed the Argyll Robertson phenomenon, the right being myotic. The right ear was deaf. The cerebrospinal fluid contained 10 cells per c.mm. and excess of albumin.

In spite of energetic antisyphilitic treatment with injections of soluble mercurial salts and neosalvarsan, as well as one intrathecal injection of colloidal mercury, the paralysis increased steadily. On her return to hospital in August, 1919, the weakness and wasting were found to affect all the muscles of both upper and lower limbs and the trunk muscles. The scapular muscles were greatly atrophied, and the scapulae were 'winged'. The neck and face muscles were only slightly affected. There was loss of sensibility to the tuning-fork over the whole of the right lower limb, and in the left leg below the knee. Sense of position was lost in the toes but preserved elsewhere in the limbs. No other loss of deep or cutaneous sensibility was discovered.

The patient died at the end of August, 1919, about two years after the beginning of the paralysis. During this time she had undergone several courses of intensive antisyphilitic treatment, but this had no effect on the progress of the paralysis.

Post-mortem examination showed recent tuberculosis at the apices of both lungs, but no other disease outside the nervous system. The cord was abnormally thin along the whole of its length. The anterior roots were greyish and atrophied, and there was some thickening of the arachnoid over the dorsal surface of the cord. Microscopically there was surprisingly little evidence of cellular infiltration either in the meninges or around the walls of the vessels. In a few places a slight degree of perivascular infiltration was seen, but this was not pronounced. The connective-tissue septa and pia arachnoid were thickened, and this was practically the only sign of syphilis observable. The cells of the ventral horns and of Clarke's column were greatly diminished in number, and those which remained showed chromatolytic and other degenerative changes, but there was no neuronophagy.

Sections stained for myelin showed an irregular degeneration of the posterior and lateral columns resembling much more closely that seen in subacute combined degeneration than that of tabes dorsalis. The degeneration of the posterior columns was not systematized, although the column of Goll was more degenerated than that of Burdach. In the lateral columns the pyramidal tracts and the cerebellar tracts were both involved, and there was also irregular degeneration at the surface of the ventral part of the cord. The degeneration in the lateral columns was greatest between the 5th and 10th thoracic segments, with degeneration of the cerebellar tracts above and of the pyramidal tracts below this level.

Although the authors use the word *sclerosis* in describing the case, they insist that there was no overgrowth of neuroglial fibres and little

evidence of proliferation of neuroglial cells. In contrast to what is observed in subacute combined degeneration, no compound granular corpuscles were seen.

This case is of interest, both on account of its unusual nature, and also owing to the doubt as to the rôle played by syphilis in its etiology. It is known that syphilis may produce amyotrophy, but this is usually, though certainly not always, associated with tabes. Its power of producing primary degeneration of the nerve-cells in the cord along with a diffuse degeneration of the posterior and lateral columns has, so far, been unknown. The case, however, presents resemblances to those described by Henneberg, Sioli, Holmes, and others, to which the authors make no reference.

J. G. GREENFIELD.

[164] **Disturbances of pallæsthesia in traumatic lesions of the peripheral nerve trunks** (I disturbi della pallestesia nelle lesioni traumatiche dei tronchi nervosi periferici).—C. FRANK. *Arch. gen. di Neurol., Psichiat., e Psicoanalisi*, 1921, xl, 66.

In considering the disturbances in the pallæsthesia (vibration sense) of a limb, it is necessary to study the nervous supply of the periosteum. Hitherto the supply of the large bones has been accurately worked out, but that of the hands and feet has never been carefully established. This the author has done, and he appends tables and figures. Thus, for the arm he finds that the radial nerve supplies the periosteum of the humerus, of the epicondyle (sometimes of the epitrochlea), the radius, the styloid process of the radius, the radial half of the carpus, the first metacarpal, and sometimes the second, third, and fourth metacarpals and the first, second, third, and fourth fingers. The median nerve supplies the second and third metacarpal, the first, second, and third fingers, and sometimes the radius and radial half of the carpus.

The ulnar nerve supplies the epitrochlea and sometimes the epicondyle, the olecranon, the ulna, the styloid process of the ulna, the ulnar half of the carpus, and the fourth and fifth metacarpals and fingers. These periosteal branches transmit vibration sense, for in lesions of the median nerve which supplies the diaphyses of the radius and ulna the vibration sense on these bones is retained, while in lesions of the radial and ulnar nerves which supply their periosteum it is lost. Analogous results are found in the lower limb.

He concludes that pallæsthesia is conveyed by different fibres from those for superficial sensibility, since he found that it was possible to observe clinically (1) disturbances of pallæsthesia without disturbances of superficial sensibility, and vice versa; and (2) disturbances of both, but with differences of extensity and intensity. The sympathetic fibres relating to bones do not convey sensory impulses, but have to do with the trophic functions and preservation of elasticity. The fibres relating to pallæsthesia would seem to run with the motor nerves, but are more resistant to injury than the motor fibres. Rarely hyperpallæsthesia may be observed and has been described in tabes. The author considers its presence in a nerve

lesion as of prognostic value with regard to regeneration of the motor fibres. In one case he observed parapallæsthesia.

Functional disturbances of pallæsthesia may occur either alone or in conjunction with organic disturbances. Pallæsthesia may be lost without loss of pressure sensation, but pressure sensation is never lost without loss of pallæsthesia. This is because if pressure sensation is to be lost a lesion of the whole nerve is necessary, since pressure sensation derives its stimuli from so many sources.

The author concludes then that pallæsthesia is a form of deep sensation which is independent of all other forms of sensation. He was able to test the perception of vibrations on a piece of exposed bone, and found that this was more intense than on the opposite side, so proving that the soft parts had nothing to do with this sensation: and, as the nerve to the diaphysis of the bone does not subserve this sense, it follows that the periosteum and the nerves to the periosteum are concerned in its transmission. The author thinks that vibration sense is the perception of a special stimulus, and not merely of rhythmical tactile or pressure stimuli.

If pallæsthesia is present in the bones whose periosteum is supplied exclusively by the ulnar or sciatic nerves, a complete lesion of these nerves may be excluded, and, if it is absent, it is probable that the nerves are completely divided; but the same conclusions must not be drawn with regard to the radial and median.

R. G. GORDON.

[165] Certain aspects of post-diphtheritic diaphragmatic paralysis.

—H. R. MIXSELL and E. GIDDINGS. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 590.

THE authors comment on the paucity of reference in the literature to diaphragmatic paralysis. Paralysis of some sort occurs in 10 to 25 per cent of cases, and in spite of the statements of earlier writers this incidence is diminished by the early administration of antitoxin. Paralysis of the phrenics occurred in 8 out of 1259 cases of diphtheria, and was fatal in all. These paralyses occur from the fifth to the seventh week of the disease, and the condition may be mistaken for lobar pneumonia. The breathing is entirely intercostal, helped by raising of the shoulders. The abdomen is scaphoid in most cases, and before paralysis is established there is vomiting, tachycardia, and dyspnoea. There is cyanosis and pallor and occasionally acute epigastric pain. No treatment seemed to be of any use in the authors' experience, but they quote a case of Dr. Marriot's in which a child recovered after artificial respiration had been carried on for five days. They remark on the necessity of rest in cases of paralysis, and the futility of administering antitoxin after the third day.

R. G. GORDON.

## TREATMENT.

[166] The re-education of motor aphasics (La rééducation des aphasiques moteurs).—J. FROMENT. *Paris méd.*, 1921, Oct. 267.

THE author states that the older views of motor aphasia have not taken into account adequately a fact, fully emphasized by P. Marie, that



intellectual defect is commonly associated with motor aphasia. The following conclusions follow ten years' study of difficult cases of this sort.

Cases in which speech is spontaneously restored may be seen not only in the mild and temporary lesions but in some of the grave types. The mechanism is uncertain: but the cause is usually that the patient is taken in hand by his relatives, who re-educate him on the same lines as one applies to a small child learning to talk. Many cases, on the other hand, remain unimproved for as long as fifteen years, and are then partially or wholly cured of their motor aphasia by systematic re-education.

The methods of re-education are in general two. The older method is essentially didactic, by articulation exercises and co-ordination of the voluntary muscles of articulation.

The newer method which the writer has used (in association with Monod) consists in the re-education of attention, emotional control, and inhibition, and in the removal of that lack of confidence which the patient shows in his attempts at articulation. In the writer's opinion the patient has not really forgotten the complex act of co-ordination, since this is in health automatic and unconscious after the simple evocation of an elementary sound which sets going the whole corresponding reflex mechanism, unless the response be inhibited. It is because the aphasic is able neither to evoke nor retain the combination of sounds that are characteristic of the sought-for word that he cannot articulate it.

Other sound combinations interfere in the aphasic, so that he is unable to fix his attention on a particular sound and unable to repeat the word to which the sound is a key. Moreover, the patient fears his own incapability, does not try or tries badly, inhibits, and repeats only stereotyped words. By beginning with pronunciation of simple sounds one often increases the patient's mistrust in his own powers of expression. If the first lessons consist of practice in elementary acts such as blowing or sighing, e.g., for the *f*'s and *v*'s, we re-associate the ideas and images which tend to re-fix the sound in the aphasic's mind. As soon as a new sound is obtained, it can be fixed by a simple short word which begins with that particular sound; the act to produce the sound, the sound itself, and a particular word will then be re-associated and perhaps retained. New sound emissions vary in difficulty with individual patients, and they quickly forget lessons at first. Where inhibition, inattention, and intellectual defects are present in the same patient, the simplest acts are acquired only after a regular struggle. Memory aids, such as writing, drawings, and simple objects, are useful in training the memory.

Elocution and reading aloud are used later; small words of similar construction often act as keys to a whole series; words denoting articles of diet, of occupation, and pastimes are useful. Many months will be taken up in pronunciation and reading aloud.

In conclusion, practical results vary much according to cases. The defects of intellect are the most hampering of all the difficulties, and these are the very difficulties which have escaped general recognition in the past, so that attempts at treatment have often failed on this score.

J. LE F. B.



- [167] The treatment of gliomatous syringomyelia by x rays (*Le traitement de la syringomyélie gliomateuse par les rayons x*).—J. LIERMITE. *Paris méd.*, 1921, Oct. 1, 281.

THE author rapidly reviews the pathology of the disease, and reserves the term true syringomyelia for the gliomatous new growth in the neighbourhood of the central canal. In 1907 he published his first observations, and latterly, in conjunction with Beaujard, has treated several cases by x rays, with resulting improvement in symptoms. The subjective symptoms are the most improved: amyotrophy when present seems to have been arrested: trophic changes are not much influenced in the joints, though trophic ulcers have healed in the soft parts.

An interesting case is described where a patient with cervical syringomyelia was treated with radiations from 1906 to 1914. The sensory changes in the hands improved, and the amyotrophy was so much better as to allow of the patient's return to work as a packer. In 1920 he was re-examined a few days before death from hamoptysis. Autopsy showed a long cavity from the 1st cervical segment to the lower dorsal region, but the gliomatous process in the cervical region was almost nil, this being the part subjected to radiation. The untreated dorsal cord, on the other hand, showed active gliomatous changes.

It is pointed out that a wide area of radiation should be insisted upon in these cases, using the largest therapeutic doses. The writer's histological and experimental studies show that the largest doses of x rays do not harm the healthy structures in the central nervous system. Laminectomy before radiation does not seem to be necessary, especially as the bone is less dense than usual in syringomyelia. The two sides of the cord are treated separately, screening off with lead the parts to be untreated, and filtering off skin rays by aluminium filters; the anticathode is placed 20 cm. from the skin surface.

J. LE F. B.

- [168] Spinal puncture in diagnosis and treatment.—CARL H. BASTRON. *Amer. Jour. Syph.*, 1921, v, 463.

THIS is a short review on the cerebrospinal fluid, especially in its relation to syphilitic disease of the nervous system. The only diagnostic point touched on is the early diagnosis of neurosyphilis before the appearance of nervous symptoms. The work of Fildes, Parnell, and Maitland, and of Scott and Pearson and others on this subject is briefly summarized. Weed, Wegfarth, and Ayers produced meningitis in animals by drawing off their cerebrospinal fluid during the course of an experimental septicæmia, and quoted five clinical cases of septicæmia where meningitis followed lumbar puncture. In view of these facts, Bastron considers it possible that lumbar puncture performed in the early stages of syphilis may introduce the spirochæte into the subarachnoid space and precipitate neurosyphilis. He therefore advises that lumbar puncture for diagnostic purposes should be avoided in early syphilis until the patient has had a course of antisyphilitic treatment.

He considers that the intraspinal therapy of neurosyphilis does not

yet rest on any secure foundation either of theory or results: for it is only in cases of meningeal syphilis that the drugs can by this means be brought into direct contact with the spirochæte, and these are the cases which respond most readily to general systematic treatment. In general paralysis the spirochæte is within the brain tissue, and is no more likely to be reached by intrathecal than by intravenous administration of drugs.

Bastron gives numerous references to recent papers, especially by American authors, which are valuable to anyone who wishes to enlarge his knowledge of this subject.

J. G. GREENFIELD.

[169] **Treatment of acute poliomyelitis with immune horse serum.**—

E. C. ROSENOW. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 588.

THE statistics are derived chiefly from two epidemics in 1917 and 1918. The serum used was obtained by repeated injection of the pleomorphic streptococcus from poliomyelitis, and was given intravenously, as this was found to produce better results than when it was administered intrathecally. The results were uniformly good when the serum was given in the earliest stages before the onset of paralysis, and the importance of examining the cerebrospinal fluid as to cell count and globulin reaction to determine the diagnosis at this stage is insisted on. In the later stages the results become less good; but when the paralysis was only slight, 60 out of 61 completely recovered. In those cases in which paralysis was definitely established before administration, 61 out of 123 completely recovered and there were 18 deaths.

R. G. GORDON.

[170] **Lumbar puncture in syphilitics** (*La ponction lombaire chez les syphilitiques*).—A. SÉZARY. *Paris méd.*, 1921, Oct. 1, 277.

PRESENT therapeutic measures are powerless to influence the course of general paralysis, and are able to improve tabes only slightly, but are most efficient in the early stages which precede these conditions, and which are revealed by examination of the cerebrospinal fluid. A single puncture for diagnosis is only recommended after the stage of general infection, and when sufficient treatment has been given, and a single puncture may suffice. The writer stresses the fact that the blood-serum Wassermann may be negative while there is active neurosyphilis revealed in the cerebrospinal fluid. A discussion of the time to puncture leads Sézary to state that no general rule should be kept, but that each case should be treated on its own clinical findings. His rules are: First abolish all clinical signs by treatment, and also, if possible, obtain a negative blood Wassermann; wait one month, and then give a short supplementary course of intravenous arsenobenzol; if the blood now gives a positive from a former negative Wassermann reaction, wait two and a half to three months; and if a negative Wassermann is obtained then, perform lumbar puncture. The fluid thus obtained is free from suspicion that blood infection rules the result. A good general rule is to puncture at the time when all intensive treatment is being stopped with apparent cure in sight; following this.

for three or four years less active treatment is carried out and the patients are examined clinically at intervals, when a second, less important, examination of the cerebrospinal fluid will be desirable.

There are certain rare cases of neurosyphilis, myelitis, arterial lesion, and tabo-paralysis in which the cerebrospinal fluid is normal for some unexplained reason; but these rare cases should not influence one's practice with the vast majority of others, especially in relation to their treatment.

J. LE F. B.

[171] **The cerebrospinal fluid in treated syphilis.**—J. E. MOORE.  
*Jour. Amer. Med. Assoc.*, 1921, lxxvi, 769.

THIS article deals with data obtained from 642 cases of syphilis in all stages of the disease, treated at the department for syphilis at Johns Hopkins Hospital. All the patients underwent a routine neurological examination, and those with definite neurosyphilis with clinical signs are excluded from the considerations in this paper. Routine lumbar puncture was performed after a few months' antisyphilitic treatment to notice the following points: (1) The effects of treatment on early and minor abnormalities in the spinal fluid; (2) To detect possible asymptomatic neurosyphilis; (3) To note racial differences in latent neurosyphilitic cases, as between negro and white patients; (4) To test the diagnostic value of certain minor signs and symptoms. A full routine microscopic and serological investigation of the fluids was carried out. The findings were that, of 34 cases with primary syphilis treated before secondaries had appeared, only one (2.9 per cent) showed any abnormality in the cerebrospinal fluid. After the appearance of the secondary symptoms the incidence of abnormal findings in the spinal fluid was raised to 15 per cent, no matter how long the disease had lasted or by what lesion it was apparent. Only 12.7 per cent of the whole 642 cases showed abnormal findings in the cerebrospinal fluid, thus demonstrating that treatment had been successful in clearing up at least half the early abnormalities noted by other workers in untreated cases.

Asymptomatic neurosyphilis was twice as frequent in white as in coloured patients. Of 173 patients who had minor signs in pupils, etc., 49 had also spinal-fluid abnormalities (28.3 per cent), against 7.03 per cent in other cases.

In general the serological signs of asymptomatic neurosyphilis can be made to disappear by prolonged, intensive, routine antisyphilitic treatment. In the syphilis department of Johns Hopkins Hospital more than 20 per cent of all patients are clinically, or, because of the serological evidence potentially, outspoken neurosyphilitics.

The paper concludes that a study of the spinal fluid should be made as a routine in all cases of syphilis as essential to an intelligent treatment of the disease generally. The writer recommends that spinal puncture should be performed after the first or second course of intravenous treatment, and that it should be repeated at least once before final discharge from treatment as a presumed cure. In this way the incidence of clinical neurosyphilis will be reduced to a minimum.

J. LE F. B.

## Psychopathology.

### PSYCHOLOGY.

- [172] The psycho-analytical method applied to the study of repression.  
—J. H. COOPER. *Jour. Abnorm. Psychol.*, 1921, xvi, 144.

THE aim of this article is to draw attention to the fact that whilst much has been said about the effects of repression, little has been said about the cause of it. The writer says that repression is ordinarily attributed to the effect of 'finer feelings', 'ethical principles', 'better self', 'fear morality', 'herd instinct', 'conscious standards of morality and propriety', all of which can be subsumed under the concept 'censor'. In his analyses he always finds that quite early in childhood the patient performed some act of the 'polymorphous-perverse' variety, for which the beloved parent showed displeasure. On further analysis it appears that, to please the mother, the child repressed the desire. This repression, while pleasing the parent, also secured pleasure for the child. It was therefore sexual. *Repression*, according to the writer, is a specific pathogenic method of gratifying a normal infantile sexual desire. It would appear that the reality principle, in so far as it involves repression, is orientated by a sexual motive. Human psychology is thus effectively sexualized.

JAMES YOUNG.

- [173] Affect in the dream. W. H. R. RIVERS. *Brit. Jour. Psychol. (Gen. Sect.)*, 1921, xii, 113.

IN a previous work (*Instinct and the Unconscious*), Rivers has argued that Freud's concept of the censor is superfluous, and in this article he applies a similar line of argument in an endeavour to show that the peculiarities of the affect in dreams may better be accounted for by regression to infantile mental levels than by distortion and disguise due to 'censorship'. Rivers instances nightmares and war dreams as evidence that the dream is concerned with the solution of a conflict and does not represent the fulfilment of a wish. If a satisfactory symbolic solution is arrived at, there is no affect; but in proportion as the attempted solution fails, affect is manifested. In sleep the higher levels of the mind are out of action, and it is the more primitive, lower or infantile levels which function. This regression to the infantile is held to explain both the transposed imagery and symbolism in which a conflict finds expression in a dream, and also the nature of the accompanying affect.

Thus, whilst accepting the concepts of mental conflict and repression, Rivers seeks to discredit as unnecessary the concept of the censor and of wish-fulfilment in dreams; and therefore presumably also in the psychoneuroses. He uses Freud's 'Augean stables dream' as an example upon which to demonstrate his views. It is, however, not clear what, if not opposed wishes, are in conflict, and what, if not some instance corresponding to the censor, is responsible for repression.

ALFRED CARVER.

- [174] **The anatomic seat of the emotions: a discussion of the James-Lange theory.**—CHARLES L. DANA. *Arch. of Neurol. and Psychiat.*, 1921, vi, 634.

DUE to increased attention to emotional factors of late, the James-Lange theory has been reconsidered, and there has been a leaning towards its acceptance as true, at any rate with some modification. Though this hypothesis has never been satisfactorily proved or convincingly refuted, Dana brings forward some clinical facts which seem to show that the somatic or skeletal muscles and sympathetic system proper have only a minor effect in arousing conscious emotional states. A patient broke her neck at the 3rd and 4th cervical level and was completely quadriplegic, with entire loss of sensation from the neck down, and abolition of all deep reflexes. On the peripheral theory it is difficult to see why there should have been no emotional change during the year she lived with the skeletal system practically eliminated and the sympathetic entirely so. Reference is made to patients in the terminal stage of tabes, with family periodic paralysis; to certain forms of progressive muscular atrophy; to those with absolute bodily rigidity in terminal arthritis deformans; and to those advanced stages of paralysis agitans with rigidity. In Dana's experience the emotional reactions are present and normal in such patients. It is concluded that the bodily sensations which accompany emotion are produced by stimuli from the automatic centres in the brain-stem, but they only co-operate to extend and perhaps intensify the emotion. Emotion is centrally located, and results from the action and interaction of the cortex and thalamus. The James-Lange theory is therefore regarded as true only in part.

C. STANFORD READ.

- [175] **The psychology of the dance.**—B. S. TALMEY. *Amer. Med.*, 1921, xvi, 129.

PROTOPLASM has inherent within it the impulse to rhythmic activity. The animal world danced before man either in service to individual or species preservation. In the amoeba rhythmic movements subserve hunger; in the higher animals the dance stands almost exclusively in the service of sex, its object being to produce a state of tumescence. Human infants show a love of rhythm early. In primitive peoples and in all civilizations rhythmic movements have crystallized into the dance, which is first instinctive, then studied, and later becomes an art. Early in history the dance is first met in religion and is prescribed for all solemn occasions. Later, folk-dances appeared, and gave an epitome of man's neuromuscular energy as the different trades were told in art form. Love dances, symbolizing attack, defence, and overcoming in courting, are seen to-day in many parts. In civilized western countries dances for generations expressed emotions consistent with modern life. The dance is able to draw us out of everyday life and lead us into a dream world. It is now no more a show but a social pleasure. The modern dance copies the oriental, and represents not wooing and love, but a substitute of the normal gratification of the erotic impulse. It is no longer a sublimation of the sex ardour, but is a



mode of attaining contraction and detumescence. Conflicts relating to sensuality are the subsoil for an entire army of neuroses. The only safety-valve for the repressed emotions is either solitary auto-eroticism, promiscuity, or the dance, and the latter is the least harmful of the three, though somewhat auto-erotic in character itself. The young who are not yet afflicted with repressed emotions, and the married, who have no need of repression, should better look for the gratification found in rhythmic motion in the more sedate waltz, which is free from all the tumultuous ecstatic motions as met with in the more modern dance.

C. S. R.

[176] **On the biological basis of sexual repression and its sociological significance.**—J. C. FLÜGEL. *Brit. Jour. Psychol. (Med. Sect.)*, 1921, i, 225.

FLÜGEL points out that while psycho-analysis has done much to reveal the universal occurrence of sexual repression, the intrapsychic conflict to which this gives rise, and the fate of the repressed impulses, much uncertainty still prevails as regards the nature of the repressing forces. His contribution aims at gaining a deeper insight into the biological significance of sexual repression, and then at the psychological application of this.

The biological antagonism existing between genesis and individuation was clearly enunciated by Herbert Spencer, and its tremendous significance emphasized by the principles of Malthus and Darwin. The antagonism thus expressed in biological terms corresponds with the conflict between libido and ego-trends as understood by Freud. Flügel traces in some detail the biological import of the inverse relationship between genesis and individuation as it manifests itself within a community and inter-racially, before turning to its psychological aspect. Natural selection favours the direction of human energy to work (sublimation) rather than to the alternative path of sexuality, though this more primitive and easier path remains open, and man is burdened with greater tendencies towards reproduction than he either needs or can easily control.

Apart from actual reproduction, his desires tend to be directed upon sexual matters to an extent that seriously interferes with his working ability. A further complexity is found to be involved when we consider that both tendencies are derived from the libido—cf. Freud's more recent papers concerning the narcissistic components of the libido—and a powerful sexual energy is a prerequisite of sublimation. Only a certain proportion of the available libidinous energy is capable of sublimation; attempts at excessive sublimation are apt to lead to psychoneuroses rather than to useful adaptations. It would seem as though sublimations must constantly be re-enforced by sexual functions—failure in the latter occasioning disturbance in the former.

As a result of the repression to which it has been subjected, a certain degree of inhibition has become, as it were, an integral part of the complex sexual instinct itself, even the non-reproductive partial components suffering repression on account of their associations.

If restraint is lacking, sexuality thus loses its charm, and a too abrupt approach results in a loss, not in an increase, of sexual excitement. Man seems to have made a virtue of necessity and to have utilized these restraints as a very means of obtaining an enhanced pleasure from sexuality; for sublimation, though it involves some renunciation of immediate pleasure, promotes mental development and actually brings about greater pleasure when the tension is on occasion released. Flügel finally discusses the reasons which have prevented man from recognizing the principles in question, and deals lucidly with their bearing upon social and economic problems.

ALFRED CARVER.

[177] The instinct of acquisition.—W. H. R. RIVERS. *Psyche*, 1921, ii, 100.

AN inquiry is made as to whether the acquisitive instinct is inherent or the outcome of environment. A distinction is drawn between gaining and holding; acquisition being necessarily instinctive only in connection with gaining, which is characteristic of the basic instincts. The problem dealt with is whether the concept of property has an instinctive basis. Bearing in mind the difference between individual and group interests, it is difficult to determine whether acquisition is modified from the former by grading or is the result of experience.

References are made to the instinct of acquisition in animals, birds, and insects. Eliot Howard's researches into the acquisitive instinct of birds in relation to territory show that the male is aggressive to other birds approaching his particular territory, and that this attitude is only connected with the parental and sexual instincts.

In bees the individual instinct is modified in the interests of the community, certain bees acquiring honey for the common interest. In this case the author thinks that this was primarily an individual interest, and became modified as part of the gregarious life. The bird is gregarious and sociable except when the parental and sexual functions are active at one period of the year. While the bee achieves complete socialization of the acquisitive instinct which may once have been individual, the bird has this instinct less completely socialized. It is suggested that the individual acquisitive instinct in the bird is suppressed in the interests of communal life, but that this suppression is not as complete as in the case of the bee.

In man the acquisitive instinct shows itself in collecting habits characteristic of the psychoses, and also in kleptomania, examples of regression which are striking evidence of the human instinct of acquisition. Acceptance of this depends on the belief that the psychoses and psychoneuroses are examples of regression to early stages of ontogenetic and phylogenetic development. Sometimes the impulse to collect articles of little or no value continues into adult life, but in most cases these collections have a definite relation to other social activities. All this points to the existence of a crude indiscriminating instinct of acquisition in the individual. It is questionable how much individualistic acquisition is instinctive or how much it is due to tradition and example. The fact that

kleptomania and miserliness are regarded as anti-social shows that the crude instinct is socially under control: the question therefore arises as to how far normal social acquisition is instinctive. Individual modification probably accounts for the different degrees in the human species.

In Melanesia a peculiar individualistic and communistic behaviour towards property exists. Nothing is known of individual ownership, and this common ownership is characteristic when applied to land; this is not quite universal, however, as in one island it is customary for the parent when clearing land to allot a portion of it to his children. A comparison is made between the disputes arising in consequence of this, and those connected with the acquisition of territory by birds. In man acquisition is a primary and more deeply-seated process, but in the bird and Melanesian it has been partially suppressed for social requirements. The Melanesian example shows the association of communal ownership with peace and individual ownership with strife. Both Melanesian and bird show that individual acquisition can be so greatly modified in response to gregarious needs that it practically disappears. Is this due directly to the gregarious instinct or to social tradition and example? Both Melanesian and European are individually acquisitive, and it is probable that this instinct has been modified by social conditions rather than by the gregarious instinct. This should satisfy those who advocate a change in the social attitude towards property.

ROBERT M. RIGGALL.

### PSYCHOSES.

- [178] Acute psychoses arising during the course of heart disease.  
—D. RIESMAN. *Amer. Jour. Med. Sci.*, 1921, clxi, 157.

AMONG the more important types are the following: (1) Auditory and visual hallucinations, usually recognized by the patient as such. (2) A state of confusion as a constant symptom, or only present on awakening from or on going to sleep. This mild type is common in myocardial cases with auricular fibrillation with or without decompensation. (3) Excitation with decided disorientation is not infrequently seen in elderly persons suffering with fibrous myocarditis. In some cases the state of excitement alternates with complete apathy and silence. (4) Acute mania may arise very suddenly and defy all efforts at control. (5) Delusional states, which usually take a persecutory form. The author has only seen the persecutory type in lesions of the aortic valve. (6) During attacks of Cheyne-Stokes breathing, there is at times in the dyspnoic period a state of mental excitement or delirium which subsides during the apnoic period.

Riesman then briefly considers the causes of what he terms the cardiogenic psychoses. In a psychopathic individual the connection may be accidental. A probable factor in some cases at least is kidney disease and uræmia. Acidosis may perhaps play a part sometimes. Drugs and poisons may be etiological factors. In a patient with disordered circulation alcohol may easily lead to a psychosis, and more than one writer has held digitalis responsible for maniacal and other acute psychopathic outbreaks.

C. S. R.

- [179] **Psychoses and potential psychoses of childhood.**—EDWARD A. STRECKER. *N. Y. Med. Jour.*, 1921, cxiv, 209.

TRUE mental disease in children is very rare, and out of 5000 consecutive hospital admissions there were only 18 cases under the age of 15. In 4 cases the type was doubtful: in 10 the diagnosis was manic-depressive psychosis (the depressive element being much more pronounced); and only 4 were brought under the heading of dementia præcox. These statistics do not include post-infectious mental disease, juvenile paresis, or psychotic episodes in epileptics. In children the symptomatology seems more simple. In the manic-depressive group the depression was often only an elementary emotional reaction and only supported by vague delusional formation. Mental confusion occurred frequently. Mental symptoms occurring in the course of, or as sequels to, the infectious and contagious diseases of childhood are frequent. We may expect a varying grade of delirium, and subsequently an unmotivated excitement or depression with considerable confusion, often without delusions and hallucinations. The clinical picture of the psychoses which follow epidemic encephalitis in children is more or less uniform. There are impulsive, purposeless motor acts, marked irritability, attention disorders, distractibility, an inconsistent, variable, and unstable emotional reaction, marked insomnia, and occasionally intense eroticism and precocious sexual feelings.

In speaking of the potential psychoses of childhood, Strecker draws attention to the shut-in type of personality which may eventuate in dementia præcox, and the undue amount of emotional stability, often with pronounced moodiness and sulkiness, seen in some, which may indicate a manic-depressive temperament, though this is less clearly recognized at an early age. Mental hygiene in children is seen from modern study to be of great importance.

C. S. R.

- [180] **Post-somatic psychosis.**—B. LEMCHEN. *Med. Record*, 1921, c, 49t.

UNDER this heading the author includes those psychoses that develop after a physical ailment from which the patient has recovered, such as infectious disease, confinement, trauma, in discharged soldiers, or in chronic alcoholics after they have stopped using alcohol.

Twelve typical case histories are given. The majority run a course resembling that of the dementia præcox group, but they are easily distinguished. The symptoms of post-somatic psychosis are: sudden onset, fear, confusion mild or severe, slight amnesia, hallucinosis mostly of the auditory type; physical findings of exhaustion; in some cases the signs simulate paresis. The prognosis is better than that of dementia præcox, from 40 to 50 per cent recovering under proper treatment. Lemchen suggests that the mental symptoms in patients suffering from an infectious disease may be due to the alteration in the serum which causes the neurones to react differently. What is true of infectious disease is also true of pregnancy, as antibodies are formed in the mother to counteract the destructive tendencies of the ovum toward the mother's tissues. In alcoholics there is also something formed to neutralize the injurious effects of excessive



indulgence. In trauma during repair the serum must surely be altered. We may conceive that, in the majority of people after returning to normal, the altered albumins will be reconstructed by some of the organs of the body, of which the liver, thyroid, and suprarenals seem to play the chief rôle: while in others those organs for some reason or other do not reconstruct the altered albumins in the serum, and a psychosis will result.

Treatment should consist in strengthening the neurons and destroying the irritating albuminous body in the blood. For the former, nerve tonics, continuous baths, exercise, and nourishing food are indicated: while the second factor must be attacked by seeing that the special organs involved in reconstruction are functioning properly, and perhaps helped through the administration of thyroid extract and adrenalin.

C. S. R.

- [181] **The hereditary transmission of schizophrenia in the D—family and its collaterals** (Der Erbgang der Schizophrenie in der Familie D. und ihren Seitenlinien).—H. HEISE. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1921, lxiv, 229.

THE author gives a genealogical tree extending through five generations and bearing 75 persons. These include 9 schizophrenics, 1 epileptic, and 1 senile dement, besides 14 persons who did not require institutional care and who might perhaps have passed as normal, but in whom careful examination and inquiry revealed psychopathic traits, latent schizophrenia, or prodroma of dementia præcox. The author gives notes of all these cases, points out how important it is in all such studies of heredity to pay specially careful attention to the supposedly sane members of the family, and offers the material that he has here collected as a contribution to the study of schizophrenic inheritance.

Further, he investigates the applicability of Mendelian principles to this material. He concludes that the character "schizophrenia" is recessive, and not sex-limited, even if, as Rüdin has maintained, it is dihybrid. Where, in this tree, the frequent appearance and continuous transmission of the character may suggest dominance, there is seen to have been a convergence of bilateral psychotic taint (recessive homozygote with heterozygote: RR with DR). Rüdin came to the opinion that "the persons in any way psychotic who are parents of dementia-præcox patients are distinguished from persons of sound stock through their producing a germ in which dementia præcox cannot indeed develop directly, but which, by reason of the likewise special constitution of the germ of the partner, receives in fertilization a supplementary element hitherto lacking in the substratum of disposition: thus first is constituted that dispositional whole out of which a dementia præcox can evolve". But in reference to these families investigated by Heise, the latitude that Rüdin allowed himself, by speaking of parents "in any way" psychotic, is superfluous. Heise can be more strict in the terms of his conclusion: for wherever, in this material, psychoses appear that are certainly or probably schizophrenic, there he finds that the special taint exists in the families of both parents—and in an unusually pure form, mostly as a manifest schizophrenia.

SYDNEY J. COLE.



## [182] Abnormal mental states encountered in a detention prison.—

M. KESCHNER. *Arch. of Neurol. and Psychiat.*, 1921, v, 382.

For the purposes of study, the prison population is dealt with under the headings: (1) The accidental criminal; (2) The occasional criminal; (3) The insane criminal; and (4) The habitual criminal.

1. The accidental criminal shows no intellectual defect, but is emotionally unstable, and under stress he may easily commit assaults. After commitment he finds difficulty in adjusting himself to his environment, and frequently develops a prison psychosis or Ganser's syndrome. His clouding of consciousness after much anxiety seems an attempt to exclude the painful impressions and reminiscences from consciousness.

2. The occasional criminal is stated to be defective in will power, very suggestible, and generally unstable in character. These constitute three-fourths of the 'detention' prison population, and often develop into habitual criminals. Many of them have dementia-præcox personalities, and differ from a later psychopathic type in that they have no intellectual defect.

3. The insane criminal constitutes only a small fraction. Among the committable cases are specially noted the deteriorated paranoïacs and the manic-depressives. Acute toxic or infectious conditions (apart from alcoholies and drug addicts) are uncommon, while the most difficult forensic problems are presented by the periodic insane and the epileptic. Among the non-committable, attention is specially drawn to the paranoid states which prisoners tend to develop when deprived of liberty and having no one to open their hearts to; depression, with delusions and visual and auditory hallucinations may ensue. The acute prison neurosis of the anxiety type is frequently seen just prior to parole or discharge and among those awaiting trial as the result of an appeal. This occurs mostly in persons of constitutional inferiority, and in those who have been charged with sexual crimes.

4. The habitual criminal is subdivided into the instinctive criminal, the professional or incorrigible, and the feeble-minded criminal. It is with this last class that the writer mainly deals, and he more or less briefly describes the wide group of constitutional inferiors as classified by Scholtz. They comprise the indolent type, the depressed, the maniacal, the impulsives, the imperatives, the pathological liar, the epileptic, the perverts, the prostitute, kleptomaniacs, the alcoholies, drug addicts, and hysterical type. Under those headings psychopathological observations of interest are made.

C. STANFORD READ.

## NEUROSES AND PSYCHONEUROSES.

## [183] The influence of the endocrines in the psychoneuroses.—

W. LANGDON BROWN. *Brit. Jour. Psychol. (Med. Sect.)*, 1921, ii, 1.

LANGDON BROWN points out that the apparently peaceful integration of higher organisms is in reality only accomplished as the outcome of a concealed struggle between its several component tissues, the final result of which is the supremacy of the central nervous system. He compares the origin of the nervous system with a group of settlers on a coast, who

gradually invade the interior and assume control over the natives. The sympathetic system, originally evolved for rapid and massive defensive purposes, retains many of its primitive features, and is closely associated with the older chemiotropic (endocrine) system. Indeed, their influence is reciprocal, yet there is a progressive evolutionary predominance of the nervous over the chemical element. In the same way the central nervous system gradually assumes control over the sympathetic.

The interaction of these three levels remains, however, so close that any disturbance of the one makes its presence felt in the others, and no matter where the disturbance originates, its ultimate effects are distributed to every system of the body. Many examples of this are given to justify the conclusion that the "endocrine glands, being influenced by toxic, functional, and psychic factors, may, alike, cause or be affected by a psychoneurosis".

ALFRED CARVER.

[184] 'War' neuroses and allied conditions in ex-service men.—

G. H. BENTON. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 360.

Cases with 'war' neuroses syndrome only occasionally present themselves, and these may be attributed to an attenuation and fixation of former symptoms. The symptom picture to-day is principally a neurosis occurring in ex-service men, and in which actual war experiences are less influential in the production of the symptoms than the environment and demands of later life, which are further nurtured by response to the influence of the spirit of the times. The symptoms have little to do with the severity of war experience, but are in direct proportion to the interpretation of that experience by the individual. It is the patient's conception of the situation and his attitude of mind towards it that determines reaction. We have, then, neuroses thoroughly akin to those of civil life, precipitated perhaps a little more quickly by virtue of certain sentimental conditions previous to going overseas, occasionally by actual warfare abroad, and the excessive sentimental conditions persisting since the return home. These perhaps influence the patient further by furnishing him with a seemingly legitimate excuse for the state he finds himself in. The presence of a recently acquired pension neurosis is continuously becoming more important and noticeable, and now frequently expresses itself as the predominant factor in a symptom-picture complex. So much has been said about compensation for the ex-service man, his care and rehabilitation, that the individual with feelings of inadequacy or real inadequacies naturally gravitates in the direction in which relief from responsibilities and the stress of life has been promised or may be assured. While some such are benefited, others remain entirely indifferent; and to each soldier accrues such results as his individual capacity is capable of. Perhaps such neurosis exists largely in the constitutional psychopathic inferior and in those whose industrial efficiency and natural desire for work and the concurrent responsibilities of life have never been very high. The writer gives a classification of the cases treated at the U.S. Public Health Service Hospital, and briefly outlines the procedure undertaken.

C. S. R.

[185] **Tropical neurasthenia, tropical hysteria, and some special tropical hysteria-like neuropsychoses.**—W. E. MUSGRAVE. *Arch. of Neurol. and Psychiat.*, 1921, v, 398.

It is stated by some that comparatively few persons entirely escape neurasthenia if they live in the tropics for any length of time, and it seems to be one of the most important diseases in those regions. A fertile hereditary soil is suggested, and among foreigners victims are created in the process of acclimatization or adjustment to the inimitable demands of an environment for which the white race is unsuited. Most striking examples are seen in young school children. In natives it is more prominent among those who are trying to adopt western methods of energy and are unprepared to do so. Women are greater sufferers than men because of the abnormal life, increased sexual activity, and the prevalent menorrhagias and dysmenorrhoeas. Secondary neurasthenia is high too, because of the large number of underlying and more obscure diseases met with. The clinical picture varies a little from that found in temperate climates in that the over-sensitiveness of sight and hearing is more defined, changes in taste and smell are as pronounced as those of other senses, and the later stage of exhaustion is more profound and recuperation slower. Hysteria has a high incidence among foreigners in the tropics, largely because of their added responsibilities, the often rapid business promotion, and various other worries not found at home. The clinical type and manifestations do not differ, however, from those seen elsewhere. Among the natives the hysterical temperament, suggestibility, and emotional instability are very widespread, and the disease is amazingly prevalent.

In discussing hysteria-like neuropsychoses, Musgrave says they are aberrant expressions of disordered neuro-mechanism among persons of a low form of mentality, and brought out by influences similar to those which produce hysteria among more developed persons. They may be classified into the mimic group, fury group, exaltation group, stoical and depression group, and the illusion and delusion group. These conditions are described, and are of great interest to the psychopathologist.

The most interesting psychosis peculiar to warm climates is that of *latah* or *mali-mali*. It is a true mimetic psychosis, characterized by coprolalia, echokinesis, and the prompt execution of given orders. Any sharp stimuli may cause an attack in a patient, and the echokinesis, consisting of more or less motion mimicry, is carried out to the point of complete exhaustion if the stimulation is continued. The disease is apparently incurable, though limiting an attack by careful control is possible. Some very good examples of *latah* echokinesis may be observed in domesticated monkeys.

In the fury group is the well-known *amok*, which in Malay means a frenzied desire to murder, and *juramentado*, a term used by the Spaniards designating a Mohammedan Moro who, after certain religious rites, undertakes to kill whom he can until he himself is killed. These conditions are not only looked upon as hysterical psychoses, but Wallace regarded it as a form of suicide. Due to defective training and education, the Malays,

who as a race are abnormally excitable and attach no importance to the lives of their fellow beings, show a great want of control of their passions and desires. The exciting cause is emotional, and after a preliminary stage of melancholic torpor, or following some religious stimulation, the frenzy attack supervenes, lasting hours to days. In case of failure to secure the coveted death, the patient sinks into a stuporose sleep.

Very similar to these fury psychoses, except that they do not go so far, are the *dalahara* of Malays and *trapekohl* of Africans. The attacks reach their apex in a spirited word quarrel, but no blows are given. In the exaltation group are included flagellate worship and certain religious and dancing ceremonies. The object of all is to secure a frenzy of emotional excitement, and an interesting phase is that element which produces self-injury to attain it. Persons of this group are quite harmless. The depressive group may be considered the antithesis of the fury group. It includes the stoics, depressives, and certain others who end by one of the forms of self-destruction. Delusion and illusion are basic factors in the characteristic oriental atmosphere. Witchery, mesmerism, devils, charms, etc., are widely prevalent, and are the elements used to rule an ignorant and emotional people for good or bad. The success attained is an indication of the psychologic condition of the masses.

C. STANFORD READ.

### PSYCHOPATHOLOGY.

[186] **Emotion and eye symptoms.**—W. S. INMAN. *Brit. Jour. Psychol. (Med. Sect.)*, 1921, ii. 47.

"It is the object of this paper to show that the eye rarely produces other than ocular symptoms unless the patient is emotionally unstable, and that he frequently is relieved, not by glasses but by suggestion, or else by some adjustment of the inner life unknown to the oculist." Inman shows that the frequency and intensity of headache and other symptoms complained of by patients sent to an oculist have no relation to the degree of strain which the error of refraction produces, and that this error, itself often insignificant, is only brought to light when the patient complains for reasons which really are unconnected with it. The symptoms complained of make their appearance during some period of emotional stress—though the patient is oblivious of this fact—and usually disappear with their emotional cause.

Inman gives many good examples of this from his own practice. The result of a *questionnaire* in a hundred consecutive cases which came to him for glasses further supports his view that the mental state of the patient, not the error of refraction, determined the onset of symptoms. Inman then deals with the emotional factor in glaucoma, unequal pupils, watering of the eyes, and squint. Squint, originating as it does in such early years, was a particularly difficult subject to investigate; but after closely inquiring into 150 consecutive family cases of squint, Inman arrives at the following conclusion. Squinting is definitely related to left-handedness and stammering, and all are traceable to faults in the child's upbringing.



Generally they express a rebellion against a harsh or oppressive regimen, though sometimes their object may be to gain a privilege otherwise inaccessible. These neurotic manifestations do not occur in the offspring of a really happy and well-balanced marriage, where the parents themselves are presumably free from troublesome fixations and the attendant conflicts.

ALFRED CARVER.

[187] **Expression of emotion in cases of mental disorder as shown by the psycho-galvanic reflex.**—E. PRIDEAUX. *Brit. Jour. Psychol. (Med. Sect.)*, 1921, ii, 23.

IN this paper Prideaux extends his previous observations on the psycho-galvanic reflex phenomenon. He begins by a theoretical consideration of the meaning to be attached to the term emotion, and defines it as "a subjective feeling consisting of central excitement and consciousness of peripheral sensations occasioned by situations which powerfully oppose or facilitate the aim of any instinctive impulse". He shows that muscular expression (instinctive impulse) is no indication of the subjective feeling experienced, and agrees with James and Janet that the expression of intense emotion in hysterical subjects is artificial; there is but little feeling connected with it.

He sees, however, in the amount of visceral reaction a quantitative indication of the subjective emotional experience, but admits that we are not justified in taking this as proved until we know more of the physiological changes underlying the psycho-galvanic reflex.

After describing his technique, Prideaux gives a table comparing the results obtained in normal, psychoneurotic, and psychotic individuals. The average decrease of resistance in healthy persons is 100 ohms; anxiety states and paranoia fall but little short of this; but cases of conversion-hysteria, epilepsy, and dementia præcox give far less decrease, while in idiots the resistance only falls by 6.8 ohms. In considering the interpretation of results, Prideaux concludes that the psycho-galvanic reflex is determined by the state of the cerebral cortex, but the relative parts played by the condition of the skin, the optic thalamus, and the autonomic system remain to be explained by further researches.

ALFRED CARVER.

[188] **The use of experimental psychology in the practice of medicine.**—E. JACOBSON. *Jour. Amer. Med. Assoc.*, 1921, lxxvii, 342.

THE author first describes some of the various tests used in experimental psychology, and then points out how these and similar tests might help to elucidate problems of clinical medicine. He suggests that useful information could be obtained from the study of: (1) The effects of suggestion, its limitations, useful application, and its effects on the various functions of the body; (2) Faith and confidence, and how these may influence and promote healthy functioning; (3) The induction of various emotional states, and how these may react on the body; (4) The origin of subjective symptoms and why they follow from certain organic changes, and reasons for the variations in different individuals; (5) The question whether



functional derangements can produce organic changes: (6) The inquiry into the mental states accompanying different illnesses, and certain other psychological aspects in relation to disease.

There can be little doubt that such a study would be of the greatest use if carried out with accuracy and under the strictest control, but the amount of material investigated would have to be very large if it were to be useful, whereas *Ars longa, vita brevis*.

R. G. GORDON.

[189] **The fear of action.**—PIERRE JANET. *Jour. Abnorm. Psychol.*, 1921, xvi, 150.

IN this paper Janet regards 'manias of action' (compulsion neuroses) and phobias as being different stages of the same process, viz., 'fear of action'. The act in question has annexed to itself a difficulty and a particular peril. Patients who have retardations, or the habit of beginning over again when executing any action in particular, before long cease to perform the action in question, and in the end they manifest fear for the objects or the situations which have relation to these activities. The fears of action manifested by the 'manias of action', or of beginning over again, are a little less marked than those fears of action which enter in the true phobias. They are regarded as the inferior degree of fear of action, that is, *anxiety* of action. He considers that the localization of fear on this or that object is purely accidental. In the very distinct group of professional phobias, as in the fear of the razor which occurs in barbers, the fear of scissors which occurs in seamstresses, the fear of prescriptions which occurs in physicians, there is found at bottom the fear of carrying on one's trade or the fear of the professional act. From this point of view the phobia is the concentration of a general fear upon a particular object. The origin of this fear is not to be found in any particular incident or group of incidents in the past which would be searched for and found by the specifically deterministic method. It is a kind of molar maladaptation which can be attributed to no more specific source than the ultimate one of the personal factor.

JAMES YOUNG.

[190] **A psychogenous limp occurring in an epileptic dream-state** (Ueber psychogenes Hinken im epileptischen Dämmerzustand).—E. ROSENHAIN. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1921, lxiv, 96.

THE patient, a man, age 24, had been thrice wounded in the war—in the arm, right leg, and nose. After the leg wound in 1916 he limped much for six weeks, but after that walked all right and was able to go back to the front. In September, 1918, he was wounded by a transverse shot through the cartilage of the nose, and was unconscious for three and a half days. Shortly afterwards he began to have epileptic fits, and it was on account of these that in 1920 he was admitted to the Breslau clinic. While having a bath on admission he had a typical major fit, with complete unconsciousness, convulsions, left-sided Babinski reflex, and loss of pupil reactions. For many hours after the fit he was in a dream-state, wandering about the ward, disarranging the beds, and hardly understanding anything said

to him: disorientation was complete. In this state he showed the symptom on account of which the case is published. With the right foot he stepped only on the toes, keeping the knee bent and the whole limb abducted; thus he limped about the ward for hours. Next day he was less confused: the limp was quite gone, and he had no recollection of it: there was complete amnesia for all that had happened in the dream-state. When the doctor mimicked the limp to show him what it had been like, the patient admitted that it perhaps somewhat resembled the limp he had had after his wound in 1916, nearly four years before: but he could not imitate it himself. A dream-state was not again observed. His gait was closely watched after his frequent fits, but no disturbance of gait was ever again noticed.

SYDNEY J. COLE.

[191] **Mental responsibility and petty crime.**—D. A. THOM. *Boston Med. and Surg. Jour.*, 1921, clviii, 407.

DETERMINING the intelligence quotient of a criminal defective is not sufficient investigation. An effort should be made to study what other factor or factors in the personality there are that make for his criminal tendencies, and to consider at least whether or not the same individual, with normal intellect, might not still have been criminally inclined. Volitional and emotional aspects must be borne in mind as well as, if not more so than, the intellectual. Glueck is quoted in the statement, "Rarely is it possible to hold a single etiological factor responsible for a criminal act. In the vast majority of instances a criminal act must be attributed to a number of antecedent inter-related causative factors, each one contributing its share toward the ultimate result, which is expressed in the anti-social act." These various possible factors at the various epochs of life are spoken of.

In a recent study of a group of men confined in a house of correction, the author was impressed by the normal intelligence of the vast majority of those examined, which led him to the conclusion that these were quite capable of determining the rightness or wrongness of their acts, but, largely by virtue of their early environment, developed character traits that became woven in the fabric of their personality in such a way and at such a time that it became tortuous and twisted, and ill-adapted to meet the demands of any environment that was not either criminalistic or psychopathic. Envy, jealousy, suspicion, hatred, feelings of inferiority, etc., may all lead to mental conflicts of which anti-social acts are the result, though the connecting link at times may seem remote. Alcohol and drugs, too, become environment problems which are subject to modification.

The case histories briefly given show that it is only after careful study of all the different aspects of the individual's life, which includes mental and physical heritage and the environment in which they have developed, that we can get a proper perspective between the cause and effect of their personality defects. Any analysis of conduct which does not take into consideration the instincts, emotions, and the will, as well as the intellect, cannot but fail to be productive of results that are worthy of consideration.

C. STANFORD READ.

- [192] Remarks upon consciousness in the epileptic fit.—L. PIERCE CLARK. *Boston Med. and Surg. Jour.*, 1921, clxxxv, 493.

ON close study, the validity of the seeming truism that consciousness is lost in the epileptic fit is questioned. In the slighter grades of petit mal there is commonly a good deal of awareness, and it must be inferred that instead of there being a loss of consciousness in totality, the subject-consciousness is really increased. In such cases the awareness of one's *surroundings* is greatly or entirely lost, but a heightened sense of consciousness is found to be present as regards the *awareness of self*. From the very nature of the fit one would expect this to be so; and in more severe epileptic reaction where subject-awareness may not be reported, we may judge by appearance and manner that the individual is not in a dissimilar state to those who can translate their feelings from the twilight state. In the grand mal state it is inferred, from the content attained during deep coma or lethargy, that such epileptics have so narrowed their subject-consciousness to the most intensive egoistic concern as to make it comparable to that at birth or earliest infancy. As self-awareness disappears in grand mal, there is an inflation or disturbance of the real unconscious motivated by such an egoistic drive that it is manifested in acts of violence in the automatism or engrossed in intensive egoistic concern, as shown in fragments of thoughts or states of lethargic *allmacht*. There is then complete power over the state of being after all phases of reality are abolished. The state is an involution of the normal development of consciousness.

One can then understand the enormous psychic importance of the epileptic fit. First it has a deteriorating influence upon sustained interest and attention and a normal mental objective life. As a result of this involution previous memories and sustained attention fail, even though mild seizures occur, and as each attack refreshes and satisfies his cruder ego-consciousness and enriches his egoistic interests, we can understand why the epileptic often assumes an indifferent attitude towards recovery. We must appeal continually therefore along lines of intensifying his personal satisfactions in everyday life comparable to that which he derives from his epileptic habit.

C. STANFORD READ.

- [193] Some notes on the stammering problem.—RALPH REED. *Jour. Abnorm. Psychol.*, 1921, xvi, 161.

THE writer's experience in a detailed investigation of some twenty cases of stammering is that almost every theory ever set forth as to the nature of the disease is contradicted. He thinks that there have been more absurd and ill-digested theories about stammering than about any other psycho-neurosis. He finds Blumcl's *Stammering and Cognate Defects of Speech* and the work of Swift and Scripture all equally deficient. He does not find that all stammerers possess the 'stammering monotone', or that their auditory memory or power of visualization is defective. For him the essential point is that an undue amount of energy flows into the muscles of speech. This is due to an emotional concentration directed towards overcoming a sense of inferiority which in many cases is perpetuated by the

predominance of a member of the patient's family. Sometimes the sense of inferiority has no such *specific* cause. In all cases there is too great consciousness of the act of speech. "We talk best when we are thinking clearly and accurately of what we want to say, rather than as to how it is being said." Therefore, for therapy, the mind must be relieved from the idea of the gravity of the speech defect.

The patient must be taught not to expect an early cure. If he is constantly looking for improvement, there can be no diminution of concentration. He is told there will be no special change to be noted when treatment is ended. This is a *volte face* from therapeutic suggestion. He is to be assisted to a state of mind towards his disorder wherein *he becomes utterly indifferent to whether he stammers or not*. This state of mind is attained through analysis, which reveals the infantile feelings and reactions giving rise to the inferiority. At the end of analysis the patient is dismissed without further reference to his speech, and told to report in six months or a year. Usually new adjustments have been made, and a definite improvement is noted.

It took a number of failures and partial successes to bring the writer to this point of view. Particularly he condemns the various methods of correcting stammering by rhythm, change of modulation, etc., because they involve direction of attention to speech *per se*. Moreover, the stammerer cannot go about for the rest of his life beating time to his conversation. He regards attempts to trace the origin to any particular incident, such as over-correction for use of obscene language, or washing of the mouth with soap and water, as superficial.

JAMES YOUNG.

[194] A case of sleep lasting five years, with loss of sense of reality.—

PIERRE JANET. *Arch. of Neurol. and Psychiat.*, 1921, vi, 467.

THE young woman, age 23, had been regarded as markedly neuropathic and emotionally unstable. At the age of 13 she began to have paroxysmal disorders of consciousness in the form of more or less prolonged fainting spells. The first bad attack occurred at the age of 14, and the patient explained that the feeling always took place when she was placed in a difficult situation or when she had to do something which was fatiguing. "In a few minutes I am gone, do not know what I am doing, and act like an automaton. . . . It is not I who order my movements; it is no longer I who act and speak." In severe attacks she would gradually become motionless, apparently fall asleep, and would remain inert for several hours. These grew more frequent, were of longer duration, and at the age of 17 she began to sleep continuously.

Janet has had her under observation for four years. For the first year she remained unchanged and was apparently sound asleep. She made no reply to questions, and reacted but little to stimulation—even to the near explosion of shells. She was easily fed without a tube, but passed her urine in bed and gave no bowel movement except through an enema. From time to time convulsive attacks took place which usually threw her out of bed. It was a mistake to presume that psychologic processes were

at a minimum, for when she thought she was not observed she took food left beside her. By persistent speaking Janet gradually got her to converse for a short period about once a week, and also succeeded in getting her to write a letter to him two or three times a month. An insight was thus gained into her peculiar mental state. The converse would cease with her remark, "Why do you want me to talk to you? You do not exist, neither do I. Good night." No signs of organic nervous disease were found. Though she imagined she was demented and delirious, she exercised her intellectual faculties in a most interesting way, was well orientated, and showed a lively imagination. The sense of unreality and feeling of automatism was well described, and she had doubts not only as to the existence of objects, but also as to their character, but her doubts mainly centred round her own personality. "At any rate, I think—but I do not exist."

Janet specially wishes to emphasize the feeling of unreality the patient had as regards her recollections, and she insisted she had no memory at all. It was this feeling of the unreality of things, persons, and memories which used suddenly to overwhelm the patient in the midst of some activity, and brought on the disorder. At first this feeling quickly disappeared, then became more prolonged, and finally continuous. The writer is inclined to think that the sense of unreality does not depend on impairment of elementary sensations or elementary psychologic phenomena, but on a reduction of activity, a lack of interest in activity, and especially on disturbance of deliberate action, which is the starting-point of reality. It is her weakness in reflection (which effects a synthesis of the various tendencies awakened) that causes her perpetual doubts and sense of unreality. Her sleep is not a real sleep, but an irrational conviction on her part which is frequent among psychasthenics. She is a psychasthenic with obsessions, devoid of will power and of the power of reflection. Gradually she took refuge in delusions and in sleep, and when her depression became more profound she began to believe in her continuous sleep.

Janet believes the condition curable. He has been able to stimulate her to do more and more, and progress has been marked. She shows much activity, but not normally, and only evinces some somnolence in the forenoon. The feeling of unreality is the same, and is persistent, because it is the fundamental symptom. The condition was one of automatic refuge.

C. STANFORD READ.

- [195] Alcohol and syphilis as causes of mental disease.—G. H. KIRBY.  
*Jour. Amer. Med. Assoc.*, 1921, lxxvi, 1062.

THE author quotes statistics which show that alcohol and syphilis are responsible for one-fifth to one-quarter of all asylum inmates. Syphilis has been demonstrated as a direct causative agent, and whether alcohol is a cause or symptom of the mental complaint it is a closely associated factor in the case-histories of many patients. He then surveys the incidence of alcoholic and syphilitic psychoses during the last decade, and comes to the following conclusions:

Alcoholism has declined perceptibly in the general population during recent years, the beginning of the decline antedating by some years the



restrictions due to war conditions and the passage of the federal prohibition amendment. Coincident with this decline there has occurred a remarkable fall in the number of alcoholic psychoses, the lowest figure on record having been reached in 1920. During the first period of the World War there was a noticeable recrudescence in both alcoholism and alcoholic mental disturbances; but after the United States entered the war in 1917 there was again a sharp fall, which, so far as alcoholic psychoses are concerned, has not since been interrupted.

Psychoses due to syphilis reached the highest point of which we have a record in the year 1918. Since then a decline in the relative and actual number of cases has occurred, which, in view of the increase of population, may be regarded as at least a hopeful sign. Whether or not the more thorough and scientific treatment of syphilis in its early stages will bring about a further reduction of neurosyphilis and syphilitic psychoses, is a question to be answered in the future.

From the standpoint of mental hygiene the situation may be regarded as encouraging. A notable advance has been made in the direction of controlling one of the outstanding causes of mental disease, alcoholism; and as regards a second great cause of mental disease, syphilis, there are indications that education, prophylaxis, and improved methods of treatment are beginning to yield some results, as yet slight, to be sure, but nevertheless sufficient to be considered a sign of progress.

R. G. GORDON.

[196] Blood analyses in cases of catatonic dementia præcox.—  
S. UYEMATSU and T. SODA. *Jour. of Nerv. and Ment. Dis.*, 1921,  
liii, 367.

THE authors briefly review previous investigations along this line, which were inconclusive, and in which no pathognomonic metabolic change was found characteristic of any given mental disease. This may be due to the grouping together of hebephrenic, paranoiac, and catatonic types of dementia præcox in one disease-entity. They selected patients of the catatonic type only, and took samples of blood from the cubital veins of patients two and a half hours after breakfast; from each sample the total nitrogen, urea, uric acid, creatinine, creatine, and sugar were estimated. Controls were obtained from the doctors, nurses, and employees of the institution. The following table of the average deviation of each constituent in the normal and in catatonic dementia præcox is given:—

	Urea N.	Uric Acid N.	Sugar	Creatine	Non- protein N.	Creatinine N.
Normal ..	13.6	10.0	9.5	9.3	8.0	7.9
Catatonic	16.6	49.5	13.4	16.5	13.8	11.4

Their conclusions are: (1) There is no definite and absolute blood formula for the catatonic dementia-præcox group. (2) In 75 per cent of

the cases studied there was a decrease of the uric acid—these cases being mostly inactive, with poor peripheral blood circulation. (3) In 47 per cent of the cases there was an increase of the amount of the blood-sugar. (4) The average deviation of each constituent of the patients' blood is higher than that of the normal, suggesting an unstable metabolic activity.

R. G. GORDON.

### TREATMENT.

[197] The arrest and cure of dementia præcox.—BAYARD HOLMES. *Med. Record*, 1921, c, 231.

It is pointed out that notwithstanding the histopathological destructive lesions in the central nervous system demonstrated by Southard, Gurd, Mott, Monakow, and others, occasionally cases of dementia præcox not only spontaneously recover after decades of deterioration, but these recoveries are marvellously complete. It has, however, been stated that the pathological changes found are not uniformly proportionate to the gravity or duration of the mental symptoms. Holmes believes that the acceptance of his theory that the disease is an intoxication will render such recoveries explicable. His theory places the production of a toxic molecule in the cæcum, which molecule, by a selective action, acts upon the brain to produce the mental symptoms and later the histopathological lesions. These symptoms are at first produced by a simple cell intoxication, which may go on to the destruction of brain-cells. The first symptoms noticed in most cases are suggestive of cerebral irritation, but a careful inquisition generally develops evidence of an antecedent period of depression. The sexual excitement of dementia præcox patients is of uncertain genesis. Ceni has shown that the molecules of cerebral neuroglia are toxic to the spermatogenesis of the testicle when liberated by cerebral concussion in animals. It seems probable that the genital symptoms are secondary to the destruction of cerebral cells and the liberation of cerebral molecules.

The author advocates its treatment by daily irrigations of the cæcum with large quantities of water five hours after the last meal of the day, in order to endeavour to terminate the production of the toxic amine. For more than one reason irrigation is best carried out through an appendicostomy. This therapy offers hope to the oldest and severest cases.

C. S. R.

[198] An effective treatment of epilepsy: phenylethylmalonylurea or luminal (Un traitement efficace de l'épilepsie).—GASTON MAILLARD. *L'Encéphale*, 1920, vii, 455.

SCPTICISM as to the efficacy of any new method of treating epilepsy is allowable when one considers the disappointments which have usually resulted; and as a rule it has been necessary to revert to the use of bromides. After extensive use of luminal, however, the author thinks he is justified in speaking eulogistically of its value.

Luminal belongs to the same chemical group as veronal. It differs from it only in the substitution of a phenyl group for an ethyl one; and it

is this phenyl constituent that gives it efficacy in epilepsy. It is essential that the luminal should be of recent preparation: otherwise it may have a toxic effect. There is no hard-and-fast rule as to dosage: it must vary with the individual. The daily dose should be given in two portions—morning and evening—in the form of cachets or tablets. The ordinary procedure is to give 20 grm. daily to an adult, and this may be raised to 30 to 40 grm. daily. In the early stages the patient may be very somnolent by day as well as by night, though in some cases there is excitement and euphoria. Even if it is thought necessary to discontinue the treatment, the drug should not be stopped abruptly.

The effect on the fits—minor attacks also—is noticeable a day or two after commencing the treatment. They cease, and then only recur at lengthening intervals, or even disappear completely. It seems possible to diminish the dose until only 10 or even 5 grm. are given daily without the fits returning.

In the early stage of treatment the psychic disorders—in contradistinction to the fits—are exaggerated, but this is only in patients who have exhibited such symptoms previously. Even these can be controlled by increasing the dose: and eventually they also disappear. The usual psychic condition of the patient is also ameliorated. Instead of progressive mental enfeeblement there has been in some instances so marked an improvement that the patients have been able to return to their work. The physical condition, so often impaired by persistent administration of bromides, is amended.

The author asks if these results are likely to be lasting, and answers the query hopefully. Other speakers in the discussion which followed the reading of his paper also recorded beneficial results from the use of luminal. Rogues de Fursac mentioned cases in which the fits ceased, but where very troublesome psychic symptoms supervened. Large doses had not, however, been given. It was generally agreed that the patients became more tractable and more fitted for social life.

HUBERT J. NORMAN.

## Reviews.

**Repressed Emotions.**—By ISADOR H. COMBAT. Cr. 8vo. Pp. 213. 1921.  
London: George Allen & Unwin Ltd. 7s. 6d. net.

THE author in his introduction compares the discoveries of Freud in psychology with that of Harvey in physiology, and the present work is an attempt to recapitulate the occurrence of 'repressed emotions' in various phases of life. He first explains the meaning of repression and touches briefly on other criteria of the Freudian doctrine. Next he traces the influence of repressed feeling in determining certain customs and types of behaviour in primitive peoples, drawing his examples for the most part from the observations of Furlong on the Tierra del Fuegians. He then mentions various examples from literature of the analysis of repressed emotion. This is most common in Russian literature, and Goncharoff's "Oblamoff" is referred to at some length as an excellent description of the extreme introvert type.

The sublimation of the primitive feelings is referred to, and the way in which religion may afford a means of escaping from the reality of these primitive feelings is pointed out. Three short chapters at the end deal with the developments of psycho-analysis in the past and the hope of its greater utility in the future, with the correspondence between material at the lower unconscious levels and the thought processes of our primitive ancestors, and with the resemblance between dreams and fairy tales.

The book is readable, but a little inconsequent. To those sympathetic with, and well versed in, Freudian concepts, there would seem little new except perhaps the claim that analysis raises the ethical and cultural level of the unconscious material apart from its introduction to unconsciousness. The work of Alder is welcomed as giving an organic basis for the neuroses. Hostile critics will not be convinced by this work, as the statements are too dogmatic and the examples are sketched out without sufficient corroborative detail to bring conviction. The unbiased inquirer, if such exist, may easily be stimulated to further reading by the work, as he will not be satisfied by it alone.

R. G. GORDON.

**Psycho-analysis and Sociology.** By AUREL KOLNAI. Translated by EDEN and CEDAR PAUL. Cr. 8vo. Pp. 179. 1921. London: George Allen & Unwin Ltd.

A REVIEW of the relationship of psycho-analysis and sociology. The first part consists in an exposition of the correspondence between the foundations and structure of society as elucidated by Durkheim and others, and the foundations of the individual personality as elucidated by Freud.

In the second part the author indicates directions in which psychoanalysis would throw light on sociology, and then proceeds to apply his doctrines to Anarchism and the various forms of Communism. If the reader accepts the full Freudian dogma and regards the Œdipus saga as an incident in everyday life, and not only an incident but the chief determinant of personality, he will no doubt see nothing extraordinary in the argument that these social theories are different manifestations of this saga. To others, however, the conclusions that the anarchist seeks a return to intra-uterine life, and that realization of his ideal would mean a community of fetuses, that the communists represent the band of brothers in the horde who have killed the father, and that the ideal social evolution would be a society whose members were all fathers, may seem perilously like nonsense. The book, however, is not without interest, and the reference to English psychology is unintentionally humorous. The style is somewhat involved in places, which is perhaps the inevitable result of the translation from a language representative of one culture to that representative of another.

R. G. GORDON.

**Advanced Suggestion (Neuro-induction).** By HAYDN BROWN, L.R.C.P.  
Pp. xiv. + 402. Second edition. 1921. Baillière, Tindall & Cox.  
10s. 6d.

"In neuro-induction we have a natural system which makes for natural process both in the prevention of certain diseases and their cure when established, whether bodily or mental." With this statement the author closes his book, but the reader, having gone carefully through the 387 pages of letterpress which precede it, will still be somewhat in the dark as to the nature and practice of neuro-induction. This is perhaps what Dr. Haydn Brown intended, for in his preface he tells us that "this book is small—suggesting that larger ones shall follow", while more than once in the book he offers to give public demonstration—under certain conditions. Dr. Brown tells us that "By neuro-induction I mean neurone induction, both of brain and body—central and peripheral—throughout". All through the book he employs a psychological nomenclature of his own, without any very lucid definition; and this makes reading difficult and not a little tiresome. On page 341 there is a glossary of suggested terms and definitions: "psychoapsis", "panapsis", "exapsis", and many others. The "supra-conscious" is "that state of consciousness in which there exists a diminution of thought power due to the confusional effects of the *ad lib.* operations of the special senses. A toxic state of the system invariably results when the amount of confusion is large". A wholesale new terminology of this kind is not likely to be of any real help in either theoretical or practical psychology.

So far as the reader can discover from this book, neuro-induction consists of a judicious combination of waking or *hypnoidal* suggestion with persuasion and re-education. The methods do not seem to be revolutionary, but, as will always be the case, they depend to a large extent on the personality of the operator.

J. R. R.



**The Psychology of Thought and Feeling.** By CHARLES PLATT, Ph.D., M.D. 8vo. Pp. x + 290. 1921. London: Kegan, Paul, Trench, Trubner & Co. Ltd. 7s. 6d. net.

THE author in his preface claims that psychology has hitherto only been treated in its entirety in the text-book manner, and sets out his aim as the giving of "a reasonably complete survey of the whole field, treating the matter briefly indeed, but, it is hoped, so suggestively that the thought may be led beyond the compass of this small book". In pursuance of this aim he ranges over a wide field, including not only psychology in its narrower sense, but education, the psychoneuroses, insanity, the crowd, and the delinquent. Naturally these many subjects are treated superficially, and every chapter lends itself to criticism on the score both of its facts and its theories; but the broad aim of showing how a knowledge of psychological principles may illuminate all the activities of man is well sustained. To the professional psychologist, psychiatrist, or educationalist the book will not prove of great value; but it is very pleasantly written, and to the general reader it should be attractive, stimulating, and useful.

**The Experiences of an Asylum Doctor, with Suggestions for Asylum and Lunacy Reform.** By MONTAGU LOMAX, M.R.C.S. Pp. 255. 1921. London: George Allen & Unwin Ltd. 12s. 6d. net.

THIS volume contains a severe indictment of the asylum system in this country. The author bases his criticisms upon experience gained as a locum tenens medical officer in two large county asylums during the war. He apparently discovered no redeeming feature whatever in these institutions, and asylum life is depicted in the gloomiest colours. This is not the place to discuss at length the criticisms contained in this volume, but it may well be questioned if the account here given accurately describes the conditions under which the insane are treated in England. Writing as an asylum doctor of several years' experience and with an intimate knowledge of a number of public asylums, the reviewer finds himself quite unable to recognize the picture of asylum life as herein portrayed. There is much brightness, happiness, earnest endeavour, and devotion to duty in asylums, and the insane as a whole are treated with humanity, kindness, and consideration. The book is calculated to give the public an erroneous and even mischievous impression of the work which is being done on behalf of the insane, and it contains a number of unjust accusations as to the attitude of asylum nurses to their patients. Much remains to be done for the insane; but if the aspirations of those who are responsible for their care are to be realized, the public will have to adopt a much more generous policy to asylums in the future than they have done in the past. Unfortunately improvements need money if they are to be carried into effect. Asylums are no exception in this respect, and the whole question is ultimately an economic one.

H. DEVINE.

**Psycho-analysis, Sleep, and Dreams.** By ANDRÉ TRIDON. Pp. xii + 161. 1921. London: Kegan Paul, Trench, Trübner & Co. Ltd. 7s. 6d. net.

THIS little volume is written for the general reader, and though it contains some observations of interest, it cannot be regarded as a significant contribution to the subjects with which it deals. The author advances the thesis that we sleep in order to dream and to be for a time our simple and unexpressed selves. He endeavours to support this more than doubtful thesis by suggesting comparisons between sleep and certain morbid conditions—notably, sleeping sickness. In describing this disorder as a neurotic manifestation, occurring in circumstances which make a flight from reality highly desirable, the medical reader will probably feel that Mr. Tridon is unduly stressing the influence of emotional factors in the production of physical illnesses.

H. DEVINE.

**Addresses on Psycho-analysis.** By J. J. PUTNAM, M.D., Emeritus Professor of Neurology, Harvard University. With a Preface by SIGMUND FREUD. The International Psycho-analytical Library, No. 1. Roy. 8vo. Pp. v + 475. 1921. London: George Allen & Unwin Ltd. 12s. 6d. net.

THIS volume consists of selections from the psychological writings of Professor James J. Putnam, the eminent neurologist of Harvard University, who died in 1918. In his later years Putnam became convinced of the importance of Freud's teaching, and soon became its chief American exponent. The extent of his interest in the subject is shown by the lengthy bibliography of his psycho-analytical lectures and writings, compiled by Dr. Ernest Jones, the editor of this new series, for inclusion in this volume. These addresses are not highly technical, and they are evidently intended to be explanatory of the wider principles rather than of the details of psycho-analysis. Though written with frankness and courage, their tone is persuasive and tentative rather than dogmatic, and they are pervaded by a spirit of sincerity, tolerance, and kindness.

Dr. Putnam was an excellent critic, and he provides a valuable and well-balanced account of the various schools of thought which have broken away from, and developed out of, the original teaching of Freud. He shows an understanding attitude towards these schismatic groups, and his criticisms are all the more forceful as he was fully alive to, and not entirely unsympathetic towards, the reasons which made a break almost inevitable. Though Dr. Putnam retained his conviction of the truth of the details of psycho-analysis, his strong philosophic leanings led him to differ from Freud on certain vital points. He was unable to accept either the pleasure-pain principle or the strictly deterministic theory of human behaviour. In some respects his views approximate somewhat closely to those of Jung, though he was unable to understand the rejection by the latter of the theories of repression, fixation, and infantile sexuality. He evidently felt that the human being could not be adequately interpreted

by the genetic or causal method, and that 'creativeness' as well as 'mechanism' had to be taken into account. The following quotation serves to indicate Dr. Putnam's view as to the possibility of innate 'higher' impulses in human beings: "... sublimation is neither solely a by-product of 'libido', nor due solely to the combined action of that influence and of the influence of social pressure. It represents, in addition, the unfolding, or coming to light, of powers which, however dependent they are for expression on both the factors mentioned, exist essentially in their own right . . .".

Dr. Putnam did not succeed in convincing his colleagues that his wider formulations could legitimately be included in their conceptions of human behaviour. They felt, no doubt, that all questions concerning ethical values lay outside the sphere of psychological investigation.

H. DEVINE.

**The Beloved Ego (Foundations of the New Study of the Psyche).**

By Dr. WILHELM STEKEL. Translated by ROSALIE GABLER. Cr. 8vo. Pp. xii + 237. 1921. London: Kegan Paul, Trench, Trubner & Co. Ltd. 6s. 6d. net.

**The Depths of the Soul (Psycho-analytical Studies).** By Dr. WILHELM

STEKEL. Translated by Dr. S. A. TANNENBAUM. Cr. 8vo. Pp. 216. 1921. London: Kegan Paul, Trench, Trubner & Co. Ltd. 6s. 6d. net.

THESE engaging volumes, in which Dr. Stekel sets out a part of a philosophy of life, show little indication on the surface of any kinship to a scientific treatise which alone might be supposed to interest a reader of this journal. On the contrary, they are manifestly the work of an artist who is the fortunate possessor of exceptional literary skill with which to express himself. As literature they will be read by a larger circle than can claim any medical knowledge; and as a portrayal of many aspects of human nature by an author with rare insight, penetrating but kindly, into the little ways of his fellow-creatures, their appeal will be as wide as is the interest in human nature.

Beneath the surface, however, each work presents a structure of quite another kind. Strip any of the chapters of its imagery and poetical allusions, and there appears an exact framework of psycho-analysis. This it is which gives form and strength to the whole, though the plan of decking out science in the habiliments of art may seem at first view something of an offence. But psycho-analysis, which as we know never permits any deflection from its aim of reaching to the roots of things, necessarily includes much that is elemental and primitive, and for this reason is unpalatable to a good many. To these, psycho-analysis is a fundamental, raw-beef way of attacking things, as opposed to the school which serveth gravy on a gold platter. But the objection to this alternative way is, of course, that no matter how splendid the platter, one never knows what cheap unwholesome stuff may not have been used in making the gravy. Dr. Stekel, however, who has long been well known as a psycho-analyst, now comes forward to please both parties. He serves his gravy on a gold

platter, but in the making of the gravy only beef—the best beef—has been used. The result is a dish which everyone will call appetizing, and the expert will know is highly nutritious as well.

This novel experiment—psycho-analysis applied artistically to inform the masses—though not unexpected, possesses a peculiar interest. Human behaviour has been discoursed upon by the great men of all ages, and their wisdom is highly prized. But they all wrote empirically, and no one except the greatest could set down reflections which are true enough to survive the passage of time. Now, however, psycho-analysis supplies the scientific basis for all such attempts, and by applying its rules men of no extraordinary calibre will be able to produce works which are no less true, and in important respects are more profound, than anything that came from these giants of old. A parallel case is found in the history of pictorial art. Painters—but only the greatest of them—drew in perspective before ever Leonardo discovered the laws of perspective, but since he formulated the science beneath the art it has been open to any painter equipped with measure and rule to draw not only in perspective but in much more accurate perspective than even a Botticelli could command. It seems probable that in psycho-analysis a similar instrument of precision becomes available, by the use of which it is possible for writers other than first-rate to attain a degree of accuracy in their psychology which hitherto has been possible only to geniuses. Dr. Stekel's experiment goes far to establish this probability as a certainty, and it foreshadows a development of unusual significance.

D. F.

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